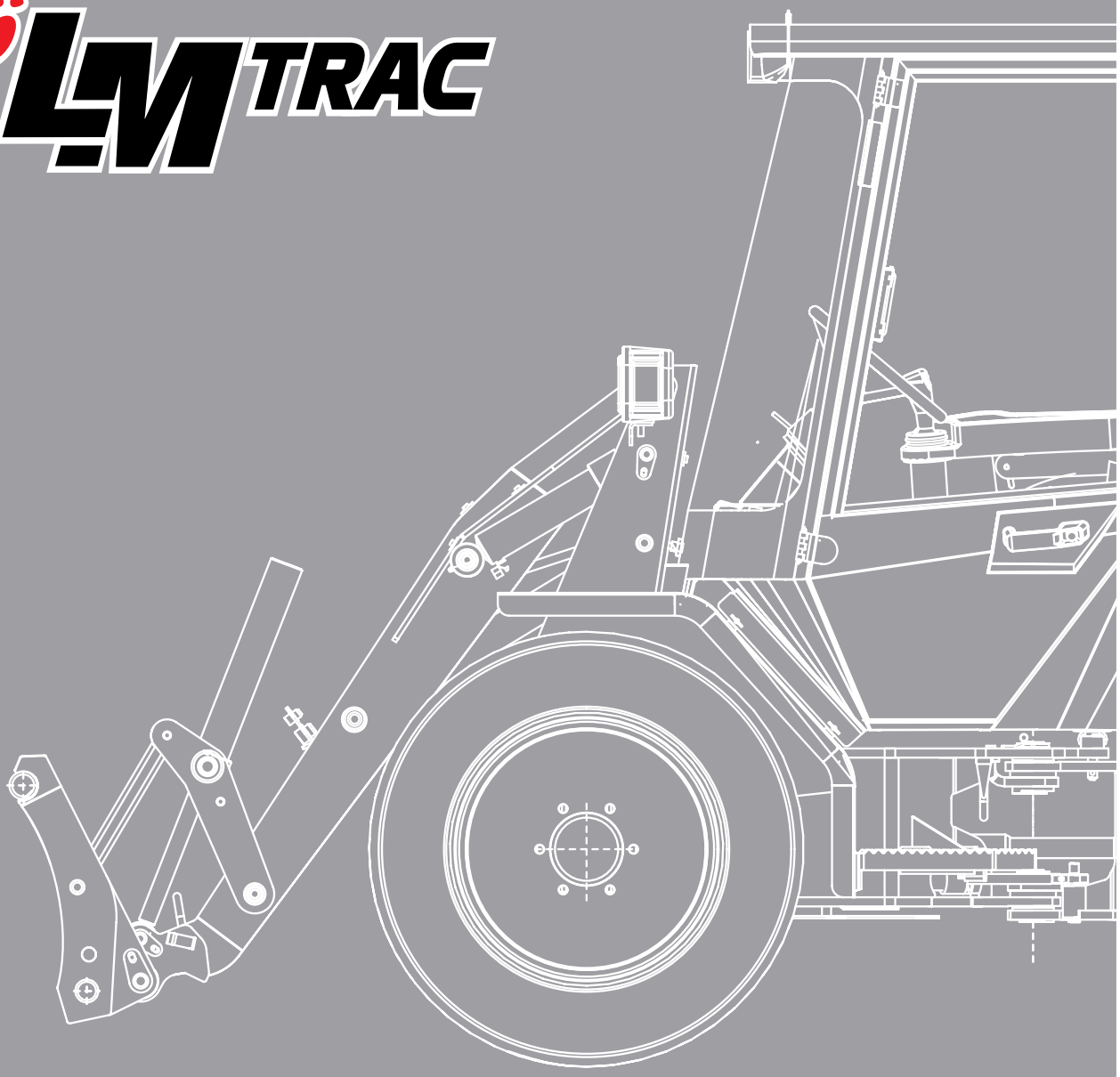
OWNER'S MANUAL



LM Trac 486

1.0 FOREWORD

Congratulations on purchasing the new LM Trac multi-purpose compact tractor. This machine is the result of Oy LAIMU Ab's innovative design and expertise.

The machine is manufactured from high-quality materials and the components used are supplied by reputable manufacturers. Strict quality standards and quality control criteria are observed in every step of design and manufacture.

This manual includes all the information you will need for the operation and maintenance of the machine, as well as giving instruction about safe working methods. This manual also includes tips for solving possible problems.

By observing the instructions and performing indicated maintenance work as scheduled, you will ensure a trouble-free and long operating life for your machine.

Pay particular attention to the safety instructions regarding operation and maintenance!

The driver of this machine must read and understand the instructions contained in this manual before using the machine. Also any person carrying out maintenance work on the machine must read and understand the instructions regarding maintenance work before commencing maintenance.

The user manual must be on board the machine at all times. If the manual is no longer readable or is lost, order a new one or the additional manuals that you need from your LM Trac dealer.

Due to our sustained and constant product development, we reserve the right to make structural and technical changes without prior notice.

For the above reason, it is possible that the machine does not correspond in full to the information provided in this manual.

Your LM Trac dealer can provide you with the latest data, and you can get a new updated version of the manual if necessary.

Oy LAIMU Ab

Info!

Copying the text and images contained in this manual even in part is forbidden.

Great care has been taken to ensure the correctness of all information contained in this manual. We are not responsible for any direct or indirect damage caused by possible errors in this manual.

Oy LAIMU Ab

1.1 Machine specifications and type plates

Write the data in the rows below:

Owner: _____ _____

Address: _____ Tel:_____

Main machine:Serial number: _____ Model:_____

Engine: Serial number:_____ Model:_____

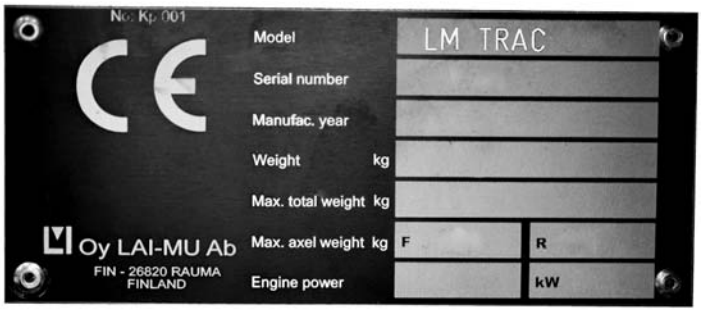
Retailer: _____ Tel:_____

Spare parts retailer: _____ Tel:_____

Service shop: _____ Tel:_____

The machine's type plate (A) is located below the door, on the left side of the machine's front frame.

Figure 1.



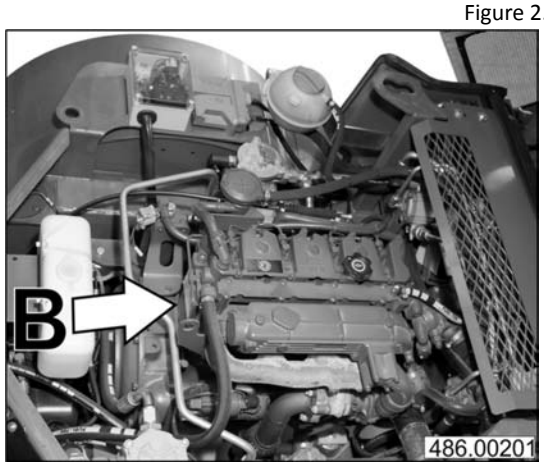
The type plate comprises:

the CE mark and

the machine's model, serial number, year of manufacture, weight, max. total weight, max. axle weights (front/rear) and engine power.

The engine type plate (B) is located on the flywheel side of the cylinder head.

Figure 2.



The engine's type plate comprises the engine model and serial number.

1.2 User manual

This user manual comprises seven (7) different sections:

01 Introduction

– Table of contents

02 Safety

03 Machine structure

04 Cabin and controls

05 Driving and use

06 Maintenance

07 Technical specifications

The LM Trac machine embodies the latest technology and its operation and maintenance also set requirements for the machine operator and maintenance engineer. By reading and understanding the information contained in this manual, you will ensure the safe and technically correct operation and maintenance of this machine.

The aim has been to create a manual that is as clear as possible and every step has been taken to ensure the sufficiency and correctness of the information presented in the manual. However, due to the many different kinds of operating conditions and methods, it may possible that some vital piece of information has been accidentally left out or is incorrect. The machine's operator must take this into account and proceed accordingly.

This manual does not contain the operating and maintenance instructions for tools that can be connected to the machine. The operator must carefully read the safety, operation and maintenance instructions of the tools being used.

1.3 Safety and environmental protection

Great care has gone into ensuring that the machine we have manufactured is environmentally sound and safe. The operator is, however, solely responsible for using the machine with respect for the environment and its safety.

Read carefully section 02 of this manual, entitled ‘Safety’.

1.4 Structural changes

Any changes to be made to the structure and/or operating system of the machine always require written authorisation from Oy LAIMU Ab otherwise the warranty becomes void.

1.5 Liability for errors and warranty

The liability for errors/warranty of Oy LAIMU Ab does not cover damage that is demonstrably the result of actions that are contrary to the instructions provided in this manual.

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2.0 SAFETY

All laws, decrees and regulations in effect must be observed in operating and maintaining the machine.

The safety and operating instructions in the manual must be followed!

The maintenance and adjustment instructions must be observed. Their observance ensures trouble-free and safe operation and long economic operating time.

In case of a failure that you cannot resolve and eliminate, please contact LM Trac Service.

Stop working immediately if there is the slightest chance of the failure causing a risk of injury or damage to the machine.

2.1 Markings and symbols

Varoitus! Varning! Warning!

The Warning sign indicates a risk of injury and/or serious material damage and gives guidance on how to eliminate these risks.

Huomaa! Notera! Note!

The Note sign is used to draw your attention to an issue or action that gives guidance on the safest and most economic operation of your machine.

Info!

Info provides you with general information about observing official regulations in different contexts (waste disposal etc.) and protecting the machine and the environment during operation and maintenance, etc.

2.2 Safety instructions

The best insurance against accidents is the observance of safety instructions.

Figure 3.

Pleas read and understand this section carefully before starting work with the machine. Every operator, regardless of past experience, must read and understand this section before using the machine. The machine's owner must inform operators about these instructions. Store the manual in its dedicated place.

2.2.1 Before use

- Study the machine and be aware of its limitations. Read the user manual before starting the machine.
- Follow all the warning and instruction labels found on the machine.
- Do not operate the machine under the influence of alcohol, medication or intoxicating substances. Fatigue can also be dangerous.

- Check the surroundings before working and installing additional equipment.
- Do not wear baggy, worn or excessively loose-fitting clothes. Clothes can get tangled in rotating parts or controls and cause accidents. Wear correct protective equipment, i.e. a helmet, safety boots, protective goggles, hearing protectors, work gloves, etc., as required by occupational safety regulations.
- Do not allow passengers inside the machine while working.
- Check for wear and the correct adjustment of mechanical parts. Replace worn and damaged parts immediately. Check the tightness of bolts and nuts regularly.
- Keep the machine clean. Accumulated soil, grease, dust and grass may ignite and cause accidents.
- Only use additional equipment and tools approved by Oy Lai-Mu Ab.
- Check before starting the machine that it has enough fuel and oil, and that it is lubricated and all maintenance procedures have been carried out.
- Do not alter the structure of the machine. It may lead to unpredictable safety risks.
- Do not let an inexperienced person operate the machine. The person lending the machine is responsible for possible damage and accidents.

2.2.2 During operation

- Enter and exit the machine is a safe way. Always use the hand grips and steps. Never grab the controls when entering the machine. Never jump up to or down from the machine.
- Start and operate the machine only from the driver's seat. Never stand up from the seat while the engine is running.
- Before starting the machine, check that all controls are in neutral position or off.
- Do not start the engine by shorting the starter connectors. Do not try to bypass the ignition switch, as the machine may start moving.
- Do not start the engine in a closed or poorly ventilated space. Exhaust gas is toxic.
- Ensure that all safety equipment and hatches are in place. Replace damaged or missing safety equipment.
- Prevent the machine from being tilted. Adjust your speed to the prevailing conditions and do not drive on slopes that are too steep.
- Keep the doors and hatches closed while driving. Do not steer the machine from outside the cabin.
- Use the controls in a safe manner. Press the accelerator pedal slowly to prevent jerky starting of the machine.
- Plan your route, avoid obstacles.
- Keep a safe distance from trenches and steep slopes. Be especially careful in rain and when driving on a wet or icy/snowy surface.
- Pay attention to other traffic. Watch where you are heading and use the roof beacon as required by local traffic legislation and decrees.
- Remember that the stability of the machine changes according to the load. Keep loads as low as possible.
- When driving downhill, let the power train do the braking. Avoid using the brake pedal to reduce your speed.
- Do not change your course or speed while driving on slopes.
- Keep hold of the steering wheel if the machine tilts, do not jump.
- Carefully follow the operating and safety instructions of tools.

- Never enter the area of the loader's steering joint while the engine is running.

2.2.3 After operation

- ► Park the machine on hard level terrain.
- ► Lower all tools onto the ground.
- ► Stop the engine.
- ► Remove the ignition key.
- ► Lock the doors.
- ► Open the main power switch.

2.3 During maintenance

- Park the machine on hard level terrain, lower all tools and stop the engine.
- Take into account that there may be residual pressure in the hydraulics system after the engine has stopped.
- If you disconnect hydraulic parts, first ensure that the oil has cooled down sufficiently to prevent burns.
- Open the connections carefully so that the oil does not discharge forcefully.
- Before maintaining the engine, exhaust piping, radiator or hydraulics, let the machine cool down completely.
- Always stop the engine before refuelling. Avoid splashing and over filling.
- Do not smoke during refuelling and battery maintenance! Ensure that no spark or naked flame gets near the fuel tank or battery. The battery releases flammable gas, especially during charging.
- Read "Using auxiliary battery" under 5.3.4 p. 35 before using auxiliary batteries in connection with start-up.
- Do not place metal objects on top of the battery terminals.
- Prevent short circuits and sparking, always disconnect the negative battery cable first and connect the positive cable first.
- Keep first aid equipment and a fire extinguisher at hand.
- Do not open the radiator or expansion tank cap before the liquid has cooled down. Unscrew the cap carefully and let the pressure discharge slowly.

Varoitus! Varning! Warning!

A needle-sharp discharging hydraulic oil jet may be invisible and penetrate clothes and skin causing severe damage.

Never check for leaks with your hands. Use a piece of cardboard or other material instead. Wear a face mask and work gloves. If oil gets under your skin, seek medical attention immediately. Oil may cause necrosis, serious infection and allergic reactions.

- The battery and its acid contain heavy metals. Dispose of batteries according to the regulations in effect.
- Observe all valid laws and regulations when disposing of oils, antifreeze, solvents, batteries and battery acid.
- Wear a face mask and safety goggles to protect your eyes and respiratory organs against dust and other particles.
- Never go underneath the machine until you are absolutely sure that it will stay in the raised position. Always use appropriate trestles or other reliable support systems.

- Lock the machine's body link with a locking pin or bar before raising the machine with lifting straps (body steered machines), for example.
- Do not lift the rolling rear axle from the middle (axle-equipped machines).
- Never go underneath a raised fork unless it is locked in place with a maintenance stand.

2.4 Labels and plates

- Follow all the instructions on the labels attached to the machine.
- Keep the labels and plates clean and in readable condition.
- Clean the labels with soap and water, dry with a soft cloth.
- Replace damaged or worn labels with new ones.
- If you replace components that carry labels, ensure that a new label is positioned in the same place.
- Stick new labels on a dry, clean and greaseless surface. The minimum temperature requirement is +10 °C.

Notes:

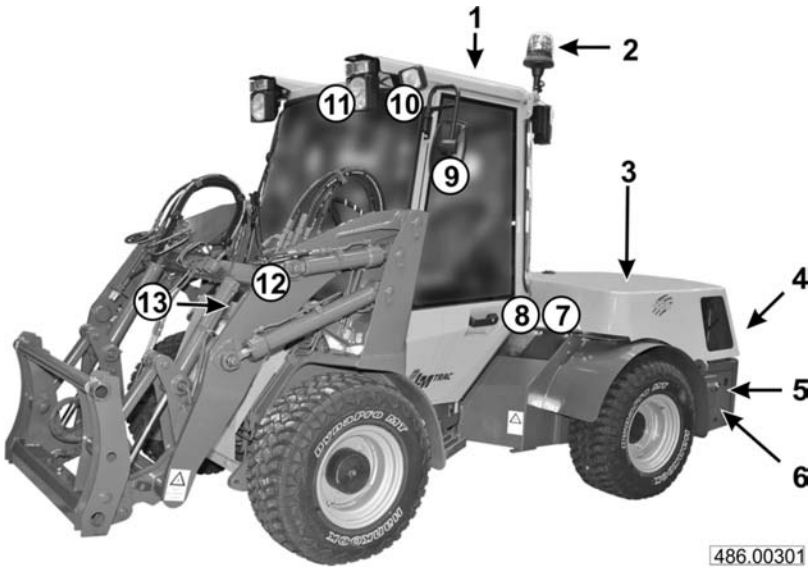
3.0 MACHINE STRUCTURE

It is vital to know the machine's structure in order to ensure safe and efficient operation and maintenance. This section covers the machine's structure, i.e. locations and names of the main components.

Detailed instructions for operation and maintenance are provided in sections Cabin and controls, Driving and use, and Maintenance.

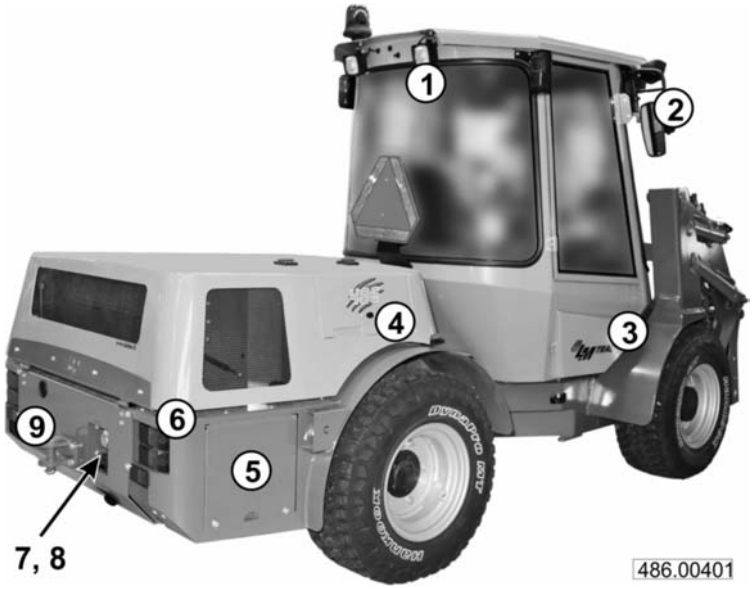
3.1 Main components and external equipment

Figure 4.



1. Cabin	2. Flashing beacon	3. Engine and hydraulic pumps
4. Rear lifter	5. Air filter	6. Auxiliary power socket and engine hydraulics
7. Fuel tank	8. Main power switch	9. Rear view mirrors
10. Working lights	11. Headlights	12. Front lifter

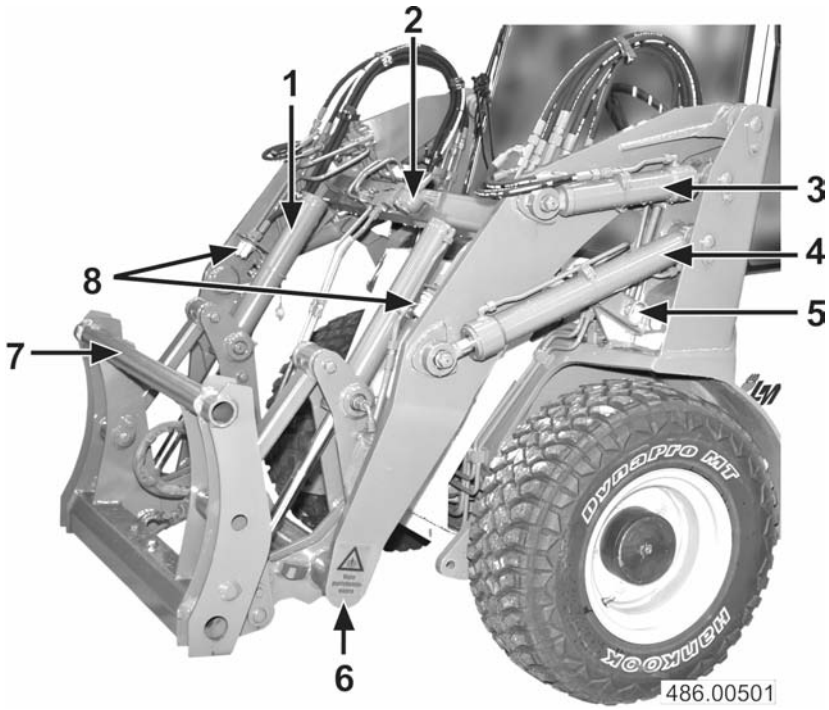
Figure 5.



1. Rear working lights	2. Side mirrors	3. Cabin fresh-air filter
4. Cooling system expansion tank	5. Battery	6. Rear lights
7. Engine block heater socket	8. Trailer socket	9. Towing equipment

3.1.1 Front lifter

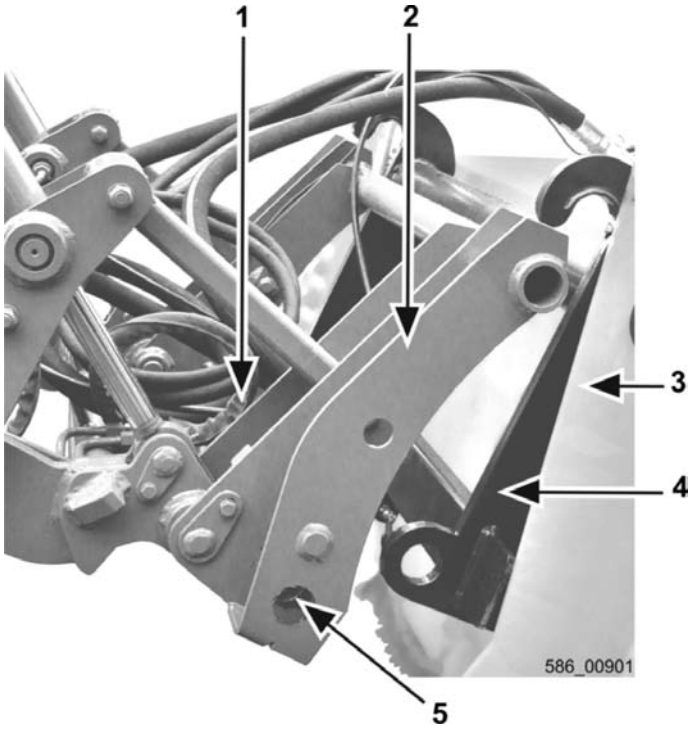
Figure 6.



1. Ladle cylinders	2. Electrical socket	3. Stabilisation cylinders
4. Lifting cylinders	5. Fork supports	6. Lifting forks
7. Quick attachment device	8. Hydraulic connectors	

Quick attachment device

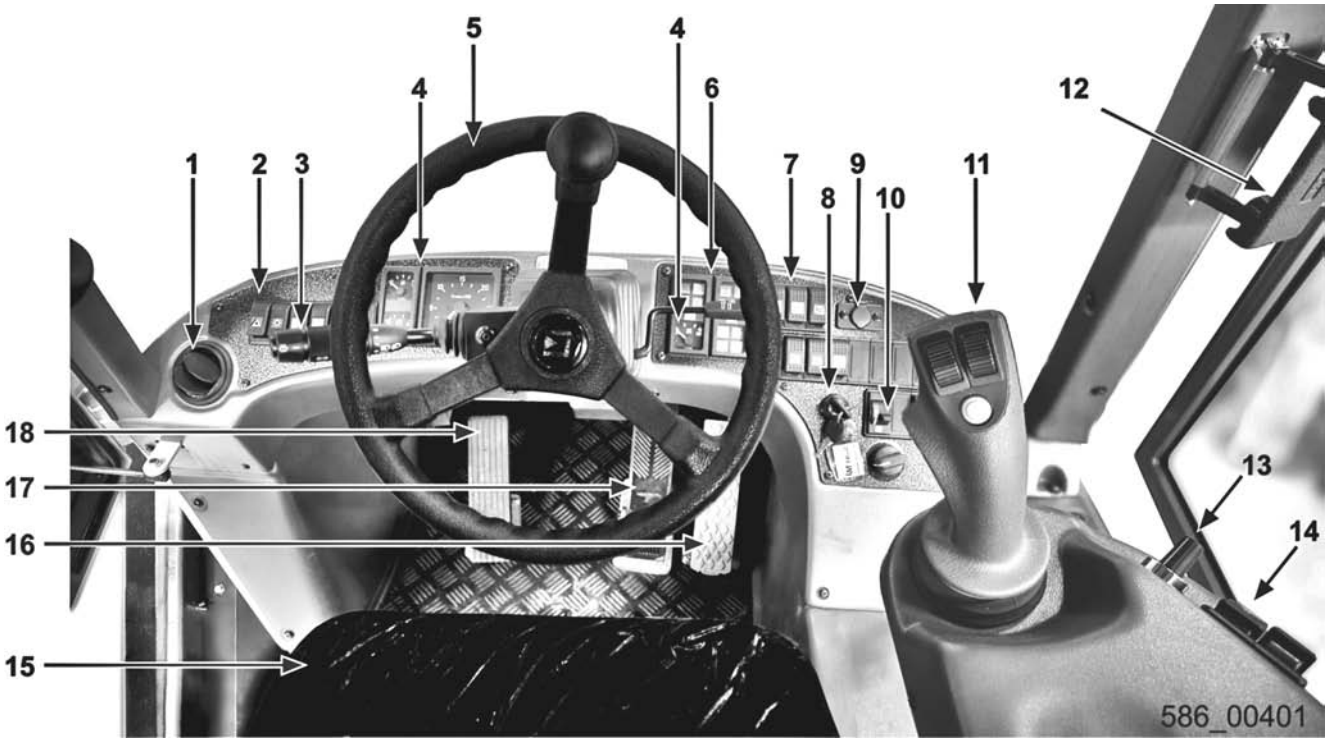
Figure 7.



1. Locking cylinder for tool attachment pins		2. Quick attachment device
3. Tool	4. Tool attachment rack	5. Attachment pins

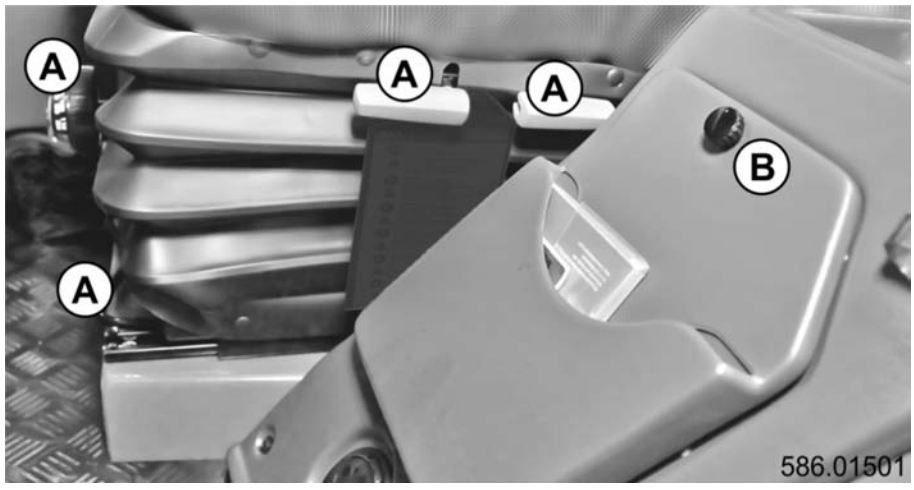
3.2 Cabin from inside

Figure 8.



1. Vents	2. Light switch panel	3. Multi-function switch
4. Instrument panel	5. Steering wheel	6. Indicator panel
7. Function switch panel	8. Ignition switch	9. Power socket
10. Heater & air conditioning	11. Fork operation lever (joystick)	12. Cabin ventilation door
13. Engine hydraulics control	14. Engine hydraulics switches	15. Seat
16. Drive pedal	17. Brake pedal	18. Crawling pedal

Figure 9.



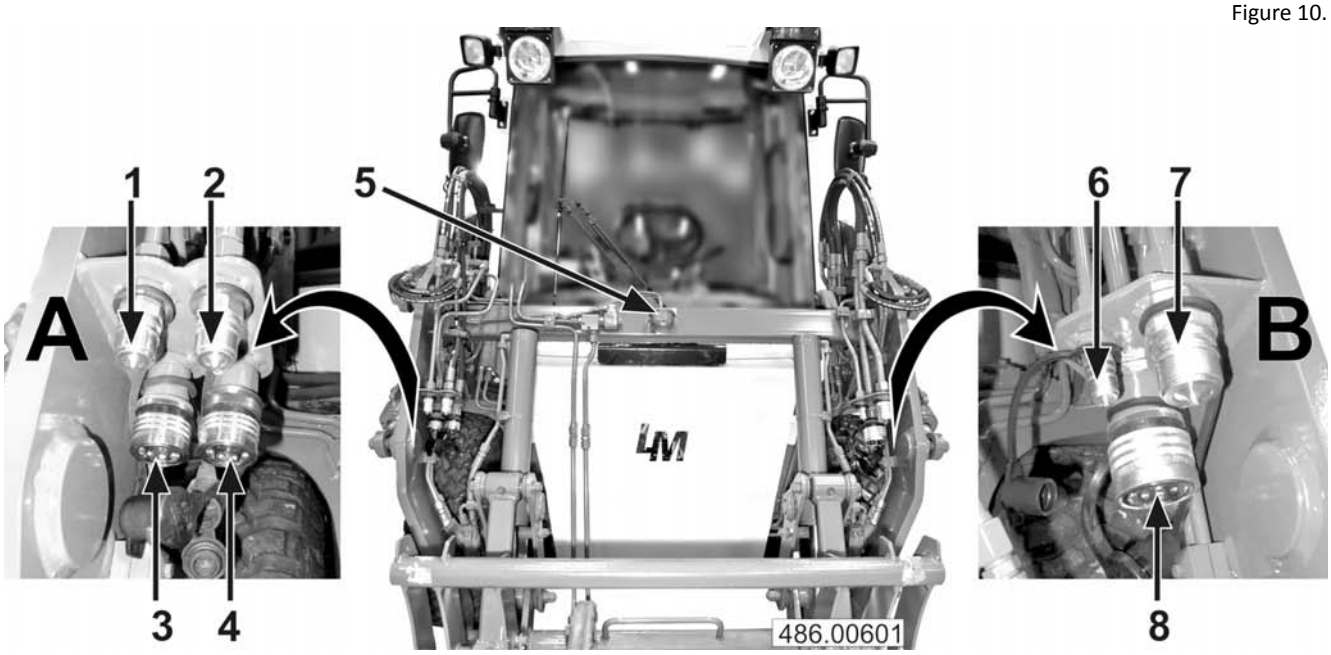
A. Seat adjustments

B. Document case, with electrical switchboard, fuses and relays below.

3.3 Hydraulic connectors (depending on the equipment of your machine)

Front

Figure 10.



A = Cylinder hydraulics

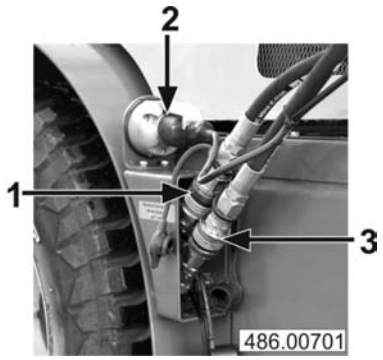
B = Engine hydraulics

1. ½” nipple, quick connector for cylinder hydraulics (nipple = male)	5. Socket for tool electricity
2. ½” nipple (quick connector for cylinder hydraulics)	6. ½” nipple (quick connector for tank line)
3. ½” frame (quick connector for cylinder hydraulics)	7. 1” nipple (quick connector for engine hydraulics)
4. ½” frame (quick connector for cylinder hydraulics)	8. 1” frame (quick connector for engine hydraulics)

Rear left

Engine hydraulics connectors (depending on the equipment of the machine):

Figure 11.



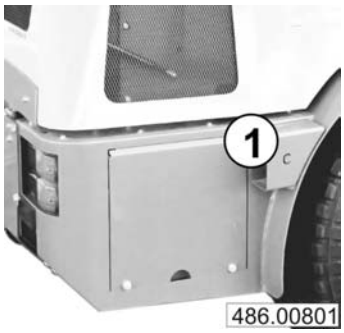
1. 1” nipple
2. Electrical socket, rear.
3. 1” frame

A tool installed at the rear or on top of the bonnet can be supplied from the electrical socket (1).

Rear right

Cylinder hydraulics quick connectors (depending on the equipment of the machine):

Figure 12.



1. Cylinder hydraulics quick connectors

½" frame

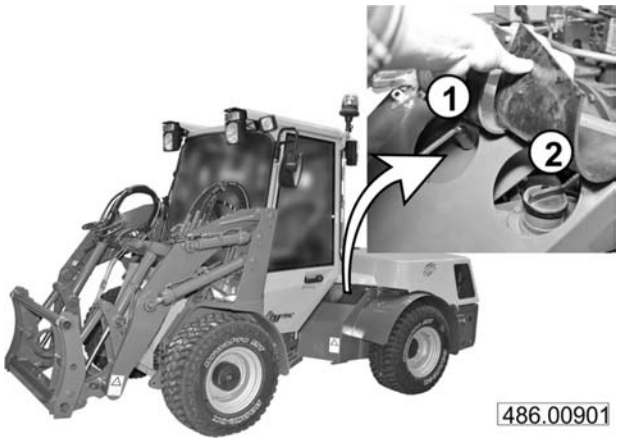
½" nipple

3.4 Battery, main power switch, fuel tank

The battery is located at the rear of the machine, see 3.1 on page 11., behind the service hatch (A). Open the two attachment screws at the bottom edge of the service hatch, pull the hatch outward from the lower edge and lower it, which releases the hatch. Tighten the fasteners carefully when reinstalling the hatch.

The battery is maintenance-free and requires no special service. Check however that the battery cables are properly attached, and that the cable connectors and the exterior of the battery are clean. Check that the battery is firmly attached.

Figure 13.



1. Main power switch
2. Fuel tank, refuelling.

The main power switch (1) and fuel filler neck (2) are located on the left side of the machine's frame, to the front of the rear wheel and below the rubber covers.

Varoitus! Varning! Warning!

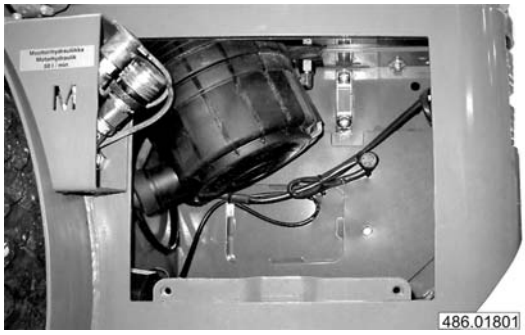
The main power switch must not be disconnected while the engine is running!

The main power switch may be used to disconnect all electrical connections between the battery and the machine.

Optional auxiliary power socket and connecting cable allow for reliable and easy supply and reception of auxiliary power.

3.5 Air filter, hydraulics sight glass, auxiliary power socket

Figure 14.

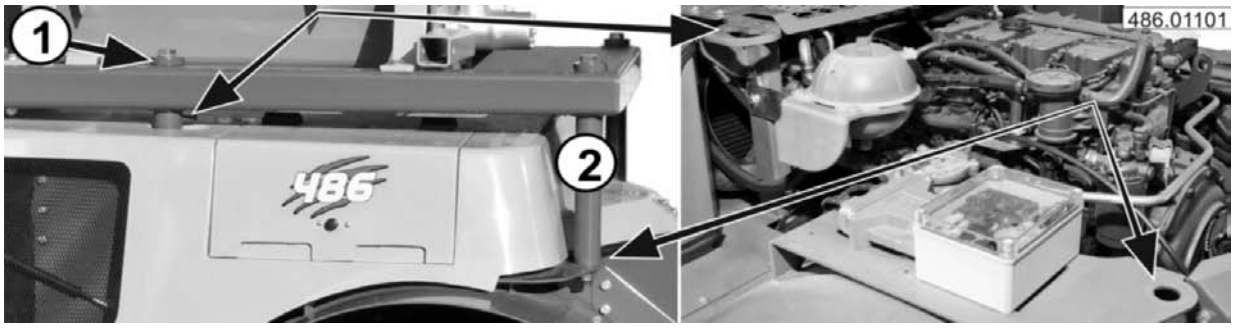


Open the two attachment screws at the bottom edge of the service hatch, pull the hatch outward from the lower edge and lower it, which releases the hatch. Tighten the fasteners carefully when reinstalling the hatch.

Behind the hatch, you will find the air filter and the filter dust pocket, the hydraulic oil tank sight glass, and the auxiliary power socket.

3.6 Tools/attachment rack installed on bonnet

Figure 15.



Fastening points for attachment rails (4 pcs).

Various tools, such as platforms or tanks, may be installed on the bonnet. They are installed on separate attachment rails, or directly using the holes in the frame. Attachment rails are available from your nearest **Lai-Mu** retailer.

Note that a device installed on the bonnet limits access to the engine compartment, and it may need to be removed for maintenance.

Figure 16.

The rear attachment holes (1) are slot-like, so the attachment rack/tool is removed as follows:

1. Loosen the rear attachment bolts (1).
2. Remove the front attachment bolts from their attachment points (2)
3. Raise the attachment rack/tool slightly and slide it forward, until the rear attachment bolts rise up from the holes.
4. Lift off the attachment rack/tool.

Attachment:

1. Loosely install the rear attachment bolts on the attachment rack/tool.

2. Lower the attachment rack/tool into place so that the rear attachment bolts enter the holes on the attachment points.
3. Lower the attachment rack/tool into place, so that the rear attachment bolts enter the holes on the attachment points.
4. Install the front attachment bolts.
5. Tighten all the attachment bolts.

Varoitus! Varning! Warning!

For lifting the attachment rack/tool, use sufficiently strong lifting equipment while taking the weight of the equipment into consideration. When installing the lifting equipment, note the location of the tool's centre of gravity, so that the attachment rack/tool is lifted and lowered as upright as possible. Proceed with caution!

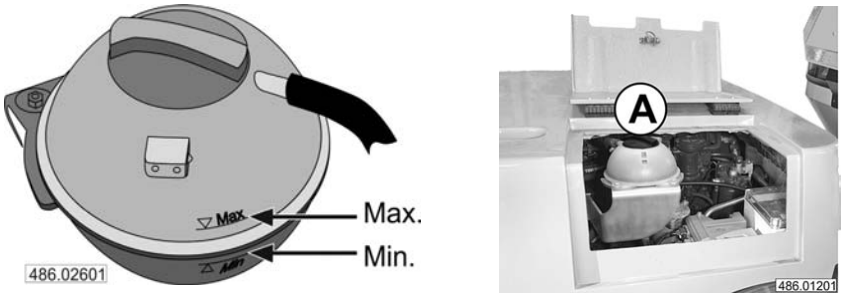
3.7 Coolant expansion tank

Varoitus! Varning! Warning!

Take care when opening the expansion tank cap on a hot engine!

Hot liquid discharged with great pressure causes severe burns.

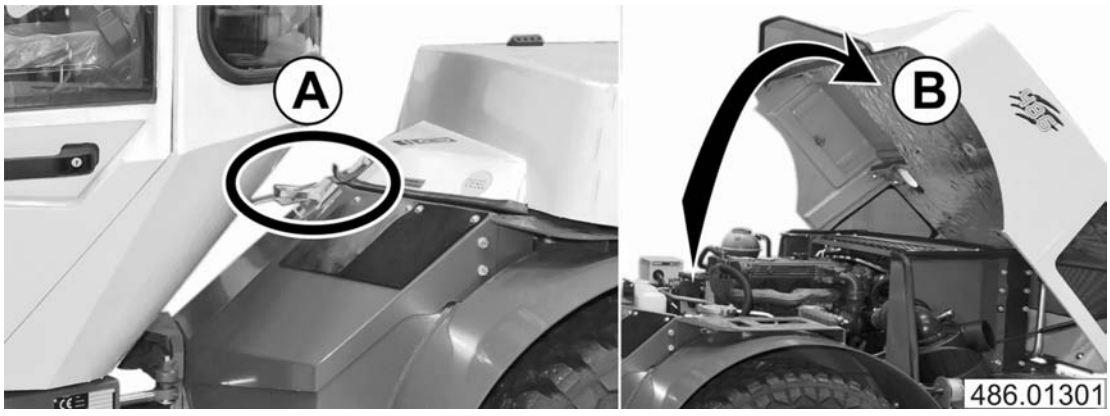
Figure 17.



The level of the coolant must be between the "MIN" and "MAX" lines when cold. Add coolant as necessary. Every autumn, ensure that the coolant is frost-proof.

3.8 Engine compartment

Figure 18.

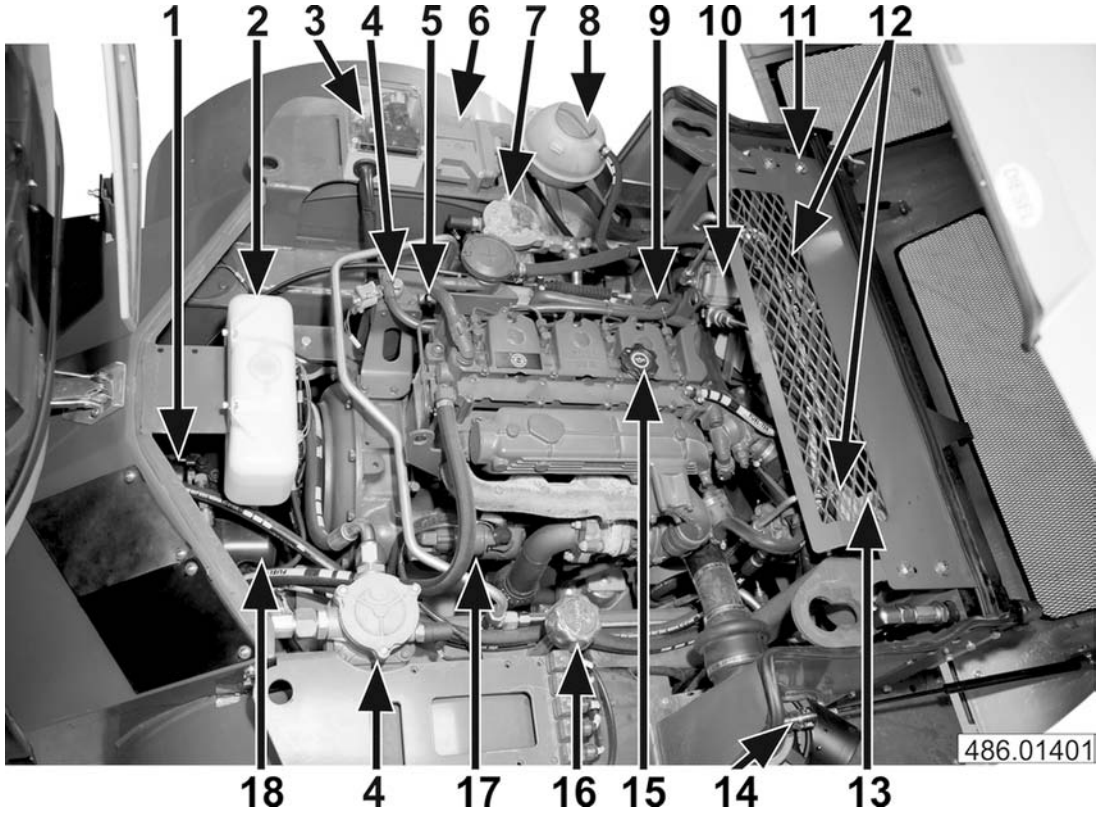


Open the latch (A) and lift up the bonnet (B). The entire engine compartment is available for maintenance.

If accessories have been installed on the bonnet, they may need to be removed for service work. Coolant levels can be checked through the service hatch, see Figure 17

3.8.1 Engine compartment components

Figure 19.



1. Hydraulic pumps	2. Windscreen washing liquid tank	3. Main fuses and relays*
4. Fuel filter	5. Oil dipstick	6. Engine control unit
7. Hydraulic return filter	8. Cooling system expansion tank	9. Alternator
10. Air conditioning compressor	11. Protective cover (4 fasteners)	12. Fans
13. Radiator/condenser cores**	14. Air filter	15. Engine oil filling
16. Hydraulic oil filling	17. Starter motor	18. Pressure filter for drive hydraulics

* The fuse and relay box (2) includes relays and the following fuses:

- Main power 80 A
- Ignition 50 A
- Preheating 50 A

The fuses are MAXI fuses.

**

The radiator and condenser cores are located behind the fans.
If necessary, clean the cores by blowing with compressed air outward from the engine side.

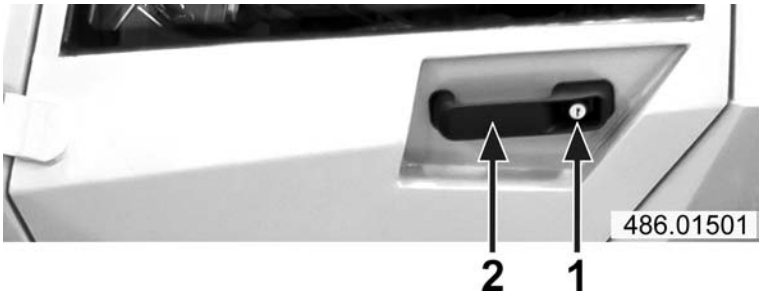
Varoitus! Varning! Warning!

Never point a strong pressure jet towards the radiator grilles.

4.0 CABIN AND CONTROLS

4.1 Doors and locks

Figure 20.



Open the door from the outside by pressing the opening button (1) and pulling the handle (2).

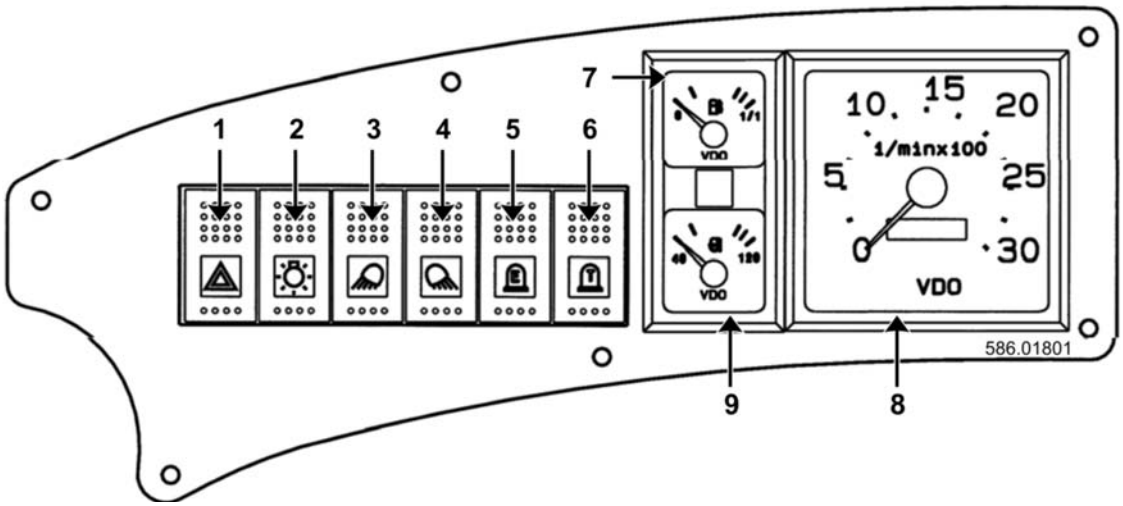
The door can be locked with the key.

Figure 21.

Open the door from the inside by lifting the lever (1)

4.2 Instrument panel, left

Figure 22.



1. Warning flasher switch	2. Parking/headlight switch	3. Front working light switch
4. Rear working light switch	5. Front roof beacon switch (*)	6. Rear roof beacon switch (*)
7. Engine temperature gauge	8. Fuel gauge	9. Tachometer/operating hour counter

(*) Depending on the equipment level of the machine!

7. Fuel gauge.

The fuel gauge displays the amount of fuel remaining in the fuel tank.

8. Tachometer/operating hour counter.

A. Tachometer

The tachometer displays the running speed of the engine (r/min). The numbers on the display are multiplied by a hundred. For example, 10 = 1,000 r/min.

B. Operating hour counter

The operating hour counter displays engine total running time. The display consists of hours and hour decimals.

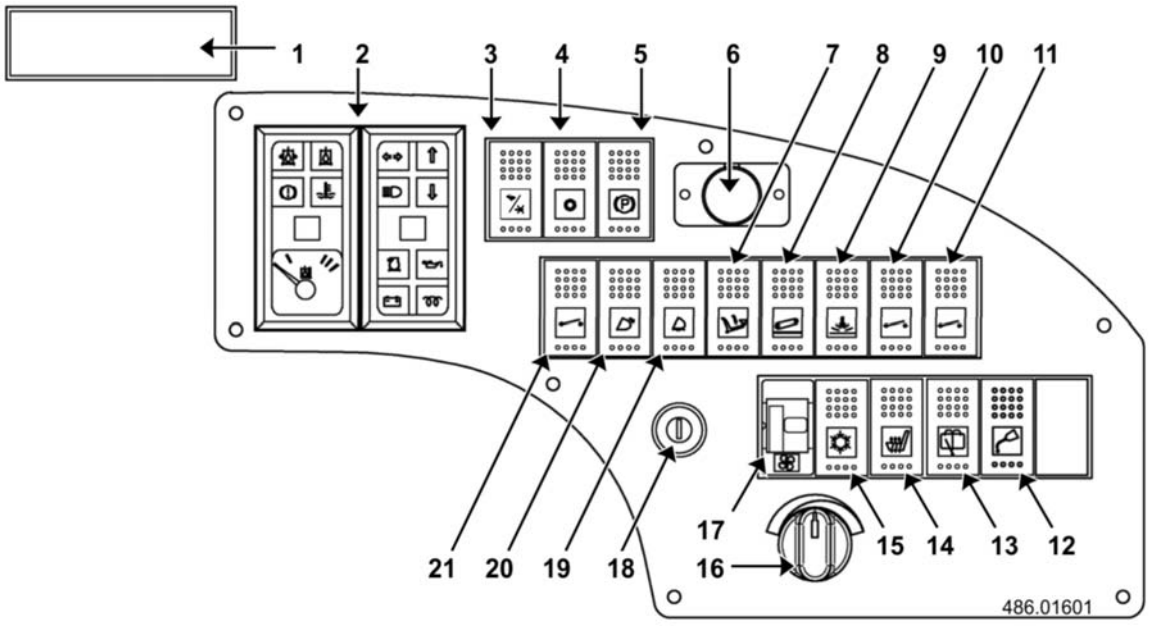
9. Engine temperature gauge

The engine temperature gauge displays the temperature of the engine coolant.

4.3 Dashboard, right

Note! The locations of the switches may vary depending on the equipment level of your machine!

Figure 23.



1. General alarm light	2. Indicator panel
3. Speed range, slow/fast	4. Light / heavy duty (*)
5. Parking brake switch	6. Power take-out socket
7. Rear lifter lift/lower switch (*)	8. Rear lifter float switch (*)
9. Rear cylinder hydraulics switch	10. Rear tool power supply 1 (*)
11. Rear tool power supply 2 (*)	12. Central lubrication switch (*)
13. Rear window wiper/washer switch (*)	14. Seat/mirror heating switch (*)
15. Air conditioning switch (*)	16. Heating adjustment
17. Heater fan switch	18. Ignition switch
19. Fork flex switch	20. Tool lock switch
21. Front tool power supply switch	

(*) Depending on the equipment level of the machine!

1. General alarm indicator

This amber light will blink if one of the following warnings is activated:

- Engine oil pressure
- Hydraulic pressure filter
- Hydraulic return filter
- Engine temperature
- Engine air filter
- Brake circuit pressure

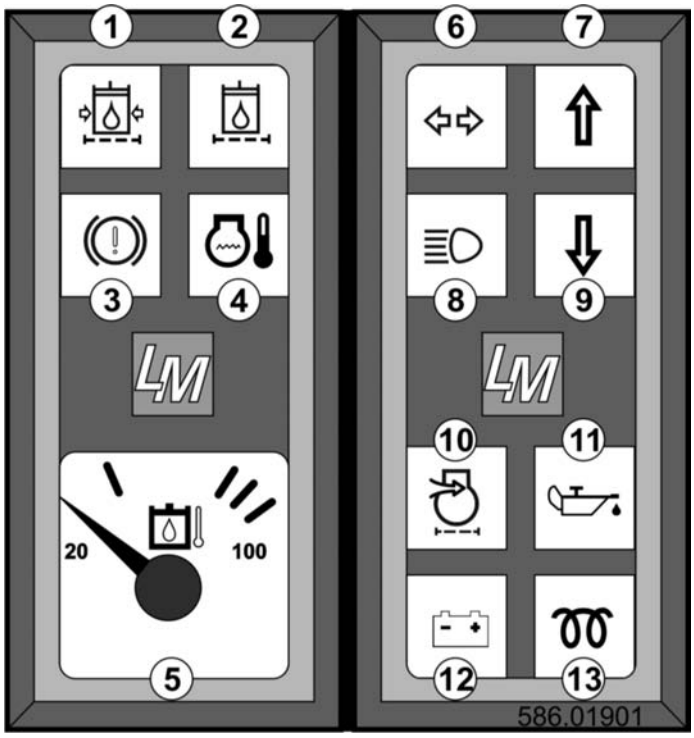
Varoitus! Varning! Warning!

When the amber alarm light blinks, discontinue using the machine immediately and turn off the engine!

Determine the cause of the alarm and perform the necessary maintenance before operating the machine.

2. Indicator panel

Figure 24.



1. Pressure filter (drive hydraulics) indicator	2. Pressure filter (operating hydraulics) indicator
3. Brake circuit pressure indicator	4. Engine coolant indicator
5. Hydraulic oil temperature gauge	6. Turn signal indicator
7. Running direction forward, indicator	8. High beam indicator
9. Running direction backward, indicator	10. Not used
11. Engine oil pressure indicator	12. Charge indicator
13. Glow indicator	

4.4 Symbols and their meaning

Learn the symbols and their meanings to make the use of the machine easy.

Warning flasher switch

All of the machine's flashers can be switched on by pressing the lower part of the switch. The indicator on the switch flashes in time with the flashers.

Parking/headlight switch

The switch has 3 positions:

1. Top part pressed: Lights off
2. Centre position: Parking lights are on
3. Bottom part pressed: Headlights are on. Switching between low and high beam is done using the multi-purpose switch on the steering column.

The parking lights function even if the power is turned off. Remember to switch off the headlights before you stop the engine.

Front working light switch

The front working lights illuminate when the lower part of this switch is pressed. The indicator on the switch illuminates when the front working lights are on.

Rear working light switch.

The rear working lights illuminate when the lower part of this switch is pressed. The indicator on the switch illuminates when the rear working lights are on.

Front roof beacon switch (if installed)

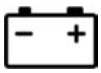
The beacon illuminates when the lower part of this switch is pressed. The indicator on the switch illuminates when the beacon is on.

Rear roof beacon switch (if installed)

The beacon illuminates when the lower part of this switch is pressed. The indicator on the switch illuminates when the beacon is on.

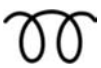
Hydraulic oil temperature gauge

This gauge displays the temperature of the hydraulic oil. Normal temperature during use is approx. 80 °C.



Charge indicator

This indicator illuminates when an error in the charging system occurs. The light illuminates when power is switched on, and turns off once the engine has started. If the indicator illuminates while driving, determine the cause.



Glow indicator

This indicator is lit when the automatic glow system is operational.

Engine oil pressure indicator

This indicator illuminates when the engine oil pressure falls too low. The light is lit when power is switched on, and turns off once the engine has started. If the indicator illuminates while driving, check the engine oil level.

High beam indicator

The blue indicator illuminates when the high beam headlights are switched on. You can switch between low beam and high beam using the multi-purpose switch on the steering column.

Reverse indicator

This indicator illuminates when REVERSE is selected

Forward indicator

This indicator illuminates when FORWARD is selected as the driving direction.

Turn signal indicator

This indicator flashes when the left or right turn signal is switched on. The turn signal can be switched on by using the multi-purpose switch on the steering column.

Pressure filter indicator

This indicator illuminates when the drive hydraulics pressure filter is clogged. Replace the filter as soon as possible.

Return filter indicator

This indicator illuminates if the work hydraulics return filter is clogged.

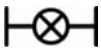
Replace the filter as soon as possible.

Brake circuit pressure indicator

This indicator illuminates if the brake circuit pressure falls too low. Determine and correct the cause for the pressure decrease before resuming work.

Coolant indicator

This indicator illuminates if the engine temperature rises too high. If the indicator illuminates while driving, check the reading of the engine temperature gauge (7). Determine and correct the cause for the overheating before resuming work.



Differential lock switch

This switch is used to switch the differential lock on the front axle on and off. When the lock is engaged, drive as straight as possible and avoid steep turns. The lock is not recommended for speeds over 10 km/h. The indicator on the switch illuminates when the differential lock is on.

PROGRAM

PROGRAM Light / heavy duty

Drive programme switch.
For more information, see 5.8 Light / heavy duty page 39.

Parking brake switch

The parking brake is switched on by means of spring force, and released by hydraulic pressure. The brake is always on when the engine is stopped. The indicator on the switch illuminates when the parking brake is on. Always apply the parking brake before stopping the engine.

Power take-out socket

The power take-out socket is of the plug type, and can be used to power a mobile phone, for example. The largest permitted current consumption is 10 A when the roof beacon is switched off.

Front tool power supply switch

This switch is used to connect power to the power take-out socket located on the front fork. Power is disconnected when the switch is released. The indicator on the switch illuminates when power is switched on.

Front tool lock switch

The front tool lock is opened and closed by holding the lower edge of the switch down and at the same time as using the hydraulic cylinder control (roll the joystick to the left).

Fork flex switch

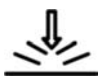
This switch is used to switch the fork flex on and off. Fork flex improves machine handling during transit when a heavy tool is attached to the fork. The flex must be switched off while working.

Rear lifter switch

This switch is used to raise and lower the rear lifter. The rear lifter will not rise if floating is switched on.

Rear lifter float switch

This switch is used to switch the rear lifter float on and off. Remember to switch off the float before lifting the rear lifter. The indicator on the switch illuminates when floating is switched on.



Rear cylinder hydraulics switch

This switch is used to route oil flow to the cylinder hydraulics quick connectors located at the back of the machine.

Rear tool power supply 1

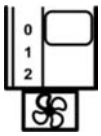
This switch is used to connect power to the first power take-out socket located at the rear of the machine. Power is disconnected when the switch is released.

Rear tool power supply 2

This switch is used to connect power to the second power take-out socket located at the rear of the machine. Power is disconnected when the switch is released.

Ignition switch

A more detailed explanation of ignition switch operation can be found under “Engine operation”.



Fan switch

The fan switch has 4 positions:

0) Off

1) Speed I

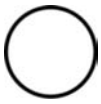
2) Speed II

3) Speed III

The highest speed is intended for quick cabin heating and windscreen defrosting. The lowest speed is usually used together with air conditioning to create the weakest possible draught.

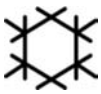
Heater control

This control is used to regulate the amount of water entering the heater core. Turning the knob to the right increases cabin temperature. Turning the knob all the way to the left closes water circulation into the heater core.



Air conditioning control

This control is used to adjust the power of the air conditioning. Do not operate the air conditioning at a too high power in order to avoid over-cooling the cabin.

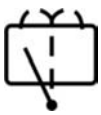


Air conditioning switch

This switch is used to switch the air conditioning on and off. The air conditioning only operates when the fan is on. Turn the ventilation vents to direct air upwards, away from the driver’s body.

Seat/mirror heating switch

This switch is used to switch the seat- and external mirror heating on and off. The indicator on the switch illuminates when the heating is switched on. Remember to turn off the heating when it is no longer required.



Rear window wiper/washer

The switch has three positions:

0) Off

1) Rear window wiper on

2) Rear window washer on

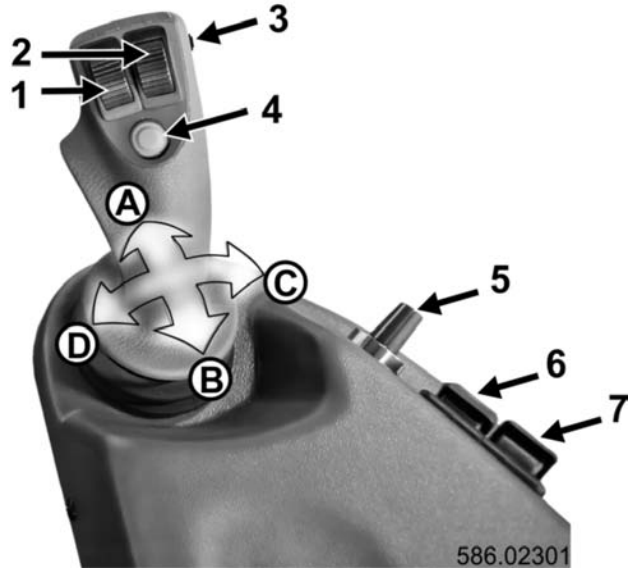
The switch returns to position 1 when released.

Central hydraulic lubrication switch

The operation of the central hydraulic lubrication system is explained in more detail in this manual, and in the manual supplied with the system.

4.5 Joystick and engine hydraulics switches

Figure 25.



Joystick movements:

A. Forward: Fork lowering

B. Backward: Fork rising

C. Right: Ladle emptying

D. Left: Ladle filling

1. Cylinder hydraulic control.

This action controls the rate of oil flow to the hydraulic cylinder, which control the forks quick release connectors. (Combined together with the locking switch = tool locked / tool open).

2. Cylinder hydraulic control.

This action controls the rate of oil flow to the hydraulic cylinders, which control the forks quick release connectors.

3. Fork floating switch

This switch is used to switch the floating of the fork on and off

4. Driving direction switch

Pressing the button always reverses the driving direction. A light on the instrument panel lights up and shows the direction of travel with an arrow, whenever someone selects a driving direction. Additional instructions are shown in the manual section “Driving and operating."

Varoitus! Varning! Warning!

Never switch on floating when the fork is up! A falling tool may cause a severe accident!

5. Engine hydraulics control

This rotating control (potentiometer) is used to adjust the oil flow to the tool connected to the engine hydraulics quick connectors at the front of the machine. Output can be steplessly adjusted between 10 and 100 l/min. Engine hydraulic power can be taken out from both the fork’s quick connectors and the quick connectors on the left side of the machine’s rear part. Output for the rear take-out cannot be adjusted.

6. Engine hydraulics switch (front)

This switch is used to route oil flow to the engine hydraulics quick connectors on the fork. For more information, see “Working with the multi-purpose machine.”

7. Engine hydraulics switch (rear)

This switch is used to route oil flow to the engine hydraulics quick connectors located at the back of the machine. For more information, see “Working with the multi-purpose machine.”

4.6 Steering column multi-purpose lever/switch

Figure 26.

Multi-purpose switch functions:

1. Horn
► Press the button at the end of the lever.
2. Right turn signal
► Lift up the lever. Remember to move the lever back to the centre position after the turn.
3. Left turn signal
► Pull down the lever. Remember to move the lever back to the centre position after the turn.
4. Windscreen washer.
► Switch on the windscreen washer by pressing the collar in the direction of the arrow.
5. Windscreen wiper.
► Switch on the windscreen wiper by turning the sleeve.
6. Low beam headlights.
► Switch on the low beam headlights by pulling the lever in the first position towards the steering wheel (I).
7. High beam headlights.
► Pull the lever one step towards the steering wheel to position II; the high beam headlights are switched on and a blue indicator light is lit on the dashboard.
8. Low beam/high beam.
► Switch between low beam and high beam by pulling the lever towards the steering wheel (point 8).

Pedals

Figure 27.

1. Crawling pedal

The machine also features a crawling pedal that can be used to slow down the machine when a higher engine RPM is required (such as when sweeping streets or cutting down plants).

2. Brake pedal

The brake pedal is used when necessary.

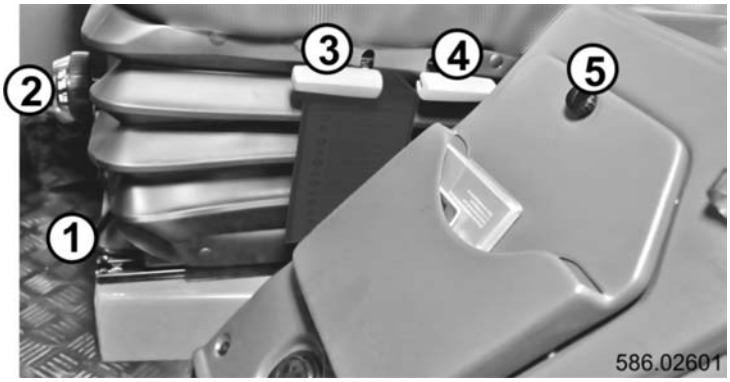
Combined use of the brake pedal and accelerator may be applied to move the machine with very high precision, such as when connecting a tool.

3. Drive pedal

Pressing the pedal increases engine RPM, causing the drive pump automation to adjust oil output to the drive motor. Drive speed may be adjusted steplessly both forward and back, with the engine RPM remaining at the highest torque point.

4.7 Seat and document compartment

Figure 28.



Seat adjustments

1. Longitudinal seat adjustment.
2. Seat flex adjustment.
3. Seat cushion front edge adjustment.
4. Seat cushion rear edge adjustment.

Varoitus! Varning! Warning!

Stop the machine before adjusting the seat.

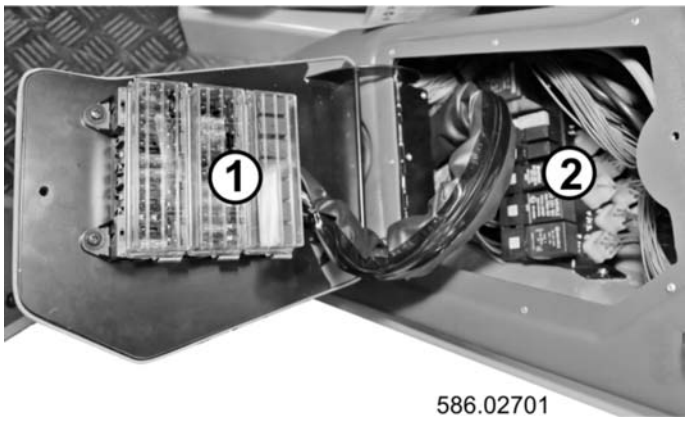
5 Document compartment

Store the machine operating manual and documents in the document compartment located on the left side of the driver seat.

4.8 Electrical main switchboard

The electrical main switchboard is located below the document compartment. Open the document compartment fastener (5 in figure above) and twist open the compartment on its hinges. The machine's fuses and relays are located behind the cover.

Figure 29.



1. Fuses
2. Relays

Radio

Figure 30.

The radio is located on the ceiling panel, to the right of the driver. The radio is provided with its own user manual.

Dome light

The dome light is located above the door, and its switch is located on the light itself. Remember to turn off the dome light before exiting the cabin.

Heater vents

Figure 31.

Air vents

The cabin has 7 air vents. The vents may be rotated, and their flaps may be turned to the desired position. The vents may also be closed.

Recirculation vents

Figure 32.

The recirculation vents are located to the right of the driver's feet. The recirculation vents are normally kept closed. The vents are opened when quick heating of the cabin air is required.

The vents must be kept open whenever air conditioning is used.

Right side window

Figure 33.

The window may be opened to improve cabin ventilation. Open the window by pulling back on the handle (1), and press it to the right to lock the window in the open position. Close the side window in the reverse order. Ensure that the window is properly closed before leaving the cabin.

Huomaa! Notera! Note!

The right side window also functions as an emergency exit as follows:

- ► Pull out the hinge pin (3) by lifting it by the ring (2).
- ► Push the window fully open.

Info!

The emergency exit must always be in working order.

- ► Regularly check that the hinge pin can be easily removed by pulling on the ring.
- ► After inspection, remember to reinstall the hinge pin.

- ► Never block the emergency exit with extraneous items; it must always be unobstructed.
- ► Do not attach any extra accessories in this area (inside or outside the cabin).
- ► The edges of the emergency exit must not have any protruding parts that may stick to clothing when exiting through the emergency exit.

4.9 Flashing beacon

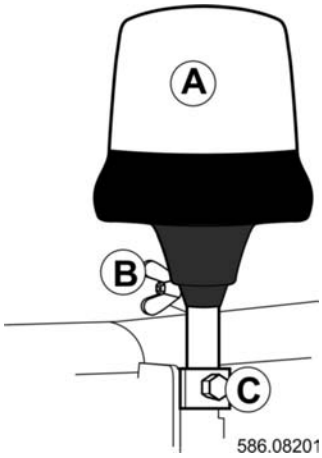


Figure 34.

You can remove the flashing beacon (A) from its stand by loosening the wing nut (B), or turn it down by loosening the fastener (C).

Info!

When using the flashing beacon, follow local traffic legislation.

5.0 DRIVING AND USE

5.1 General

- Follow safe working methods and the instructions related to safety and operation provided in this manual.
- Never operate a machine that is not in working order. Before setting off, always check that the lights, indicators, gauges and controls are in flawless working condition and also operational while driving.
- Perform all maintenance on time following the instructions provided in this manual.
- Carefully read the paragraphs labelled “Warning” and “Note” before operating the machine.
- Familiarise yourself with the controls and the operation of the machine and tool before starting use.
- Perform daily maintenance according to the maintenance programme.

5.1.1 Running-in a new machine

Special attention should be paid to the running-in of a new machine, since it also affects the durability of the machine in the future. At the start of the running-in, apply a light and variable load to the machine. Flexible use and variable loads help the different machine parts even out.

- ► Warm the engine and hydraulics before loading them.
- ► Do not operate the engine at idle or full load for longer than 5 minutes.
- ► Avoid maintaining regular speed.
- ► Avoid rapid braking or changes in driving direction.
- ► Perform the first 50-hour service according to the instructions in this manual.

Huomaa! Notera! Note!

Pay attention to the engine oil pressure and temperature while driving.
Regularly check the coolant and motor oil levels. Also pay attention to the attachment of screws, nuts and hoses, and any abrasions (wheels, exhaust, axles, water hoses, etc.). Tighten if necessary.

5.2 Start-up preparations

5.2.1 Inspections before starting the machine

- ► Walk around the machine and visually check for damage, leaks (oil/fluid) and wear.
- ► Check engine oil level.
- ► Check coolant level.
- ► Clean the grille and radiator.
- ► Refuel as required.
- ► Check hydraulic oil level.
- ► Clean the air filter dust pocket.
- ► Check the operation of all warning lights, and the hour counter reading.
- ► Check the operation of headlights.
- ► Check the condition of the tyres and their inflation pressure, at least visually.
- ► Inspect the condition of the safety cabin.
- ► Inspect the condition of all labels.

5.2.2 Fuel types

Heating oil must not be used as fuel for the engine. If a tax-free fuel is used, it must be motor-grade.

Figure 35.

The fuel tank is filled using the filler neck underneath the rubber flap (2) on the left side of the machine.

The following lists examples of acceptable tax-free fuel types:

Table: 14

Supplier	Grade
Fortum	Tempera Green (summer/winter grade) Tempera 5G Tempera 3G
Shell	Thermo City (summer grade) Thermo City (winter grade) Thermo City Premium (summer grade)
Esso	Essoheat LS Essolene LS
Teboil	Hilight Motor (summer grade) Hilight Motor (winter grade)

Info!

The fuel tank is at an overpressure of 0.35 bar.

5.2.3 Seat adjustments

Huomaa! Notera! Note!

Adjust the seat before starting the engine!

Standard seat

Figure 36.

Table: 15

1. Backrest tilt adjustment. Lift the handle and tilt the backrest.	2. Suspension stiffness adjustment. Adjust the suspension by rotating.	3. Longitudinal adjustment. Lift the handle and adjust the longitudinal position.
4. Seat cushion front edge adjustment. Lift the handle and adjust the height of the seat cushion's front edge.	5. Seat cushion rear edge adjustment. Lift the handle and adjust the height of the seat cushion's rear edge.	

Seat with air suspension

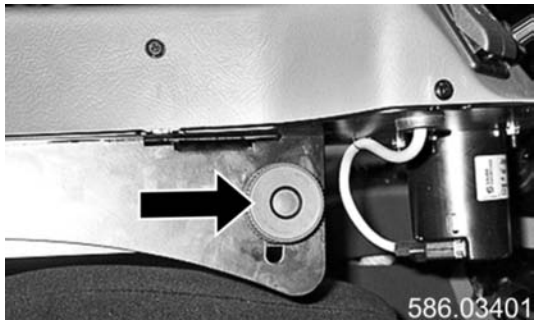
Figure 37.

Table: 6

1. Backrest tilt adjustment. Lift the lever and tilt the backrest.	2. Suspension stiffness adjustment. Adjust by pulling/pushing the knob.	3. Longitudinal adjustment. Lift the handle and adjust the longitudinal position.
4. Seat cushion front edge adjustment. Lift the handle and adjust the height of the seat cushion's front edge.	5. Seat cushion rear edge adjustment. Lift the handle and adjust the height of the seat cushion's rear edge.	

Elbow rest adjustment

Figure 38.



By loosening the adjustment screw (pictured), you can steplessly adjust the height of the right elbow rest.

Remember to tighten the adjustment screw.

Adjust mirrors

Figure 39.

Adjust the external and internal mirrors before setting off.

5.3 Starting the engine

Huomaa! Notera! Note!

Read all safety instructions.
Read all safety decals.
Never run the engine in a closed space.
Never start the engine while outside.
Always sit on the seat.

Do not operate the starter for more than 30 seconds at a time. If the engine does not start within 30 seconds, wait 2 minutes before trying again.

5.3.1 Starter lock

Figure 40.

Switch 5, See 4.3 on page 20.

Info!

The machine is equipped with a starter lock. The engine will not start if the parking brake is not on.

5.3.2 Starting

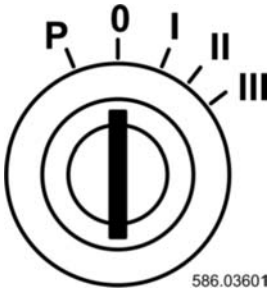
1.Check that the parking brake is engaged.

Figure 41.

2. Check that all the controls are neutral or off (including engine hydraulics).
3. Turn on the main power switch under the rubber flap (1).
4. Turn on the power.
5. Check that the following warning lights turn on:
- Engine oil pressure
- Charge
- Parking brake
- Glow indicator

6. Wait for the glow indicator to turn off, press the accelerator half way down, and turn the ignition switch to the starting position.
7. Once the engine has started, release the ignition key and allow the accelerator to rise up fully.
8. Check that the engine oil pressure and charge indicators turn off. If a warning light remains on, stop the engine and determine the cause.

Figure 42.



Ignition switch positions:

P. Not used
O. Power off
I. Power on
II. Not used
III. Start

5.3.3 Cold-starting the engine

During cold weather, we recommend using either an engine block heater or another type of auxiliary heater.

Switch on the heater well in advance before starting the engine. Using a heater will significantly reduce engine wear during cold starts, and also improves cabin heating.

Varoitus! Varning! Warning!

Using ether as a starting aid is expressly forbidden under any conditions.

Perform items 1–5 under “Starting”.

2) If the engine does not start on the first go, disconnect and reconnect power to re-enable glow plug heating.

3) Perform items 5, 6, and 7 under “Starting”.

5.3.4 Using auxiliary battery

Varoitus! Varning! Warning!

Battery gases may explode. Do not smoke near the battery and ensure no naked flames or sparks are present.

Huomaa! Notera! Note!

If the machine’s battery is frozen, do not try to start it with an auxiliary battery. Carefully follow the instructions provided.

The machine has an auxiliary power socket under a service hatch in the rear corner on the left side; this socket is used to supply auxiliary power.

If a cable with a suitable plug is not available, provide auxiliary power using starter cables from the battery of another machine as follows:

1. Drive the assisting machine close enough to the multi-purpose machine to allow the cables to connect them. THE MACHINES MUST NOT TOUCH EACH OTHER.
2. Set all controls to neutral on both machines.
3. Use protective glasses and rubber gloves.
4. Use the red starter cable to connect the positive terminals of the auxiliary battery and the machine battery.
5. Connect the black starter cable to the negative terminal of the auxiliary battery.
6. Connect one end of the black cable to the frame of the multi-purpose machine.
7. Turn on the main power switch.
8. Start the engine of the assisting machine and let it run for a while.
9. Start the engine of the multi-purpose machine.
10. Detach the starter cables in reverse order (6, 5, and 4).

5.4 Warm-up operation

Carry out the following actions after starting the engine, but before starting work:

1. Let the engine run at increased idle for 2 minutes under normal temperature, and for about 5 minutes in cold weather (winter conditions).
2. Raise and lower the fork a few times in cold weather.
3. Do not drive/operate the machine until it is warm enough, that is, the engine runs steadily and the hydraulics operate normally.

5.5 Stopping the engine

Huomaa! Notera! Note!

Always lower all tools and apply the parking brake before stopping the engine.

1. Drive the machine onto hard, level terrain.
2. Lower all tools onto the ground and apply the parking brake.
3. Decrease the engine RPM to idle, and move all controls to neutral or off.

4. Let the engine run at idle for a few minutes to cool it down.
5. Turn the ignition key to the O position and remove the key.
6. Switch off the main power switch and place the key inside the cabin.
7. Lock the cabin door before leaving the machine.

5.6 Working with the multi-purpose machine

5.6.1 Driving

The functions related to driving the LM TRAC 486 multi-purpose machine are managed using three pedals.

Figure 43.

The drive pedal (3) provides stepless adjustment of driving speed across the entire speed range, both forward and back.

Pressing the accelerator increases driving speed, while the engine RPM is kept at the highest torque point. This achieves the best possible fuel efficiency, and hydraulic output remains stable.

Lifting the accelerator reduces driving speed, and the hydrostatic power train also operates as a brake. Rapidly lifting the accelerator will therefore rapidly stop the machine. This means that by lifting the accelerator at different speeds, you can largely replace the brake pedal.

Adjust your driving speed to suit the situation and avoid rapidly lifting the accelerator (= braking forcefully).

The brake pedal (2) is usually only required to keep the machine stable on a slope.

The crawl pedal (1) can be used to reduce driving speed at high engine RPM.

This is useful when higher hydraulic output is temporarily required for the attached tools, for example. Press the accelerator (3) and the crawl pedal (1) simultaneously.

This adjusts the engine RPM with the accelerator, and the machine's driving speed with the crawl pedal. The driving speed of the machine is reduced when the crawl pedal is pressed.

Huomaa! Notera! Note!

If high output and low speed is required for a longer time, we recommend switching the driving programme. See the instructions under "Light/heavy duty" in this manual. See 5.8 on page 39.

5.6.2 Change of driving direction

Figure 44.

Driving direction can be changed by pressing the push button at the end of the joystick. The switch reverses the driving direction.

See 5.6.2 Change of driving direction page 36.

Huomaa! Notera! Note!

Driving direction must only be changed when the machine is at a standstill.

Completely release the accelerator and lightly press on the brake before changing the driving direction. When the driving direction changes, immediately release the brake pedal and press the accelerator down to achieve the desired driving speed.

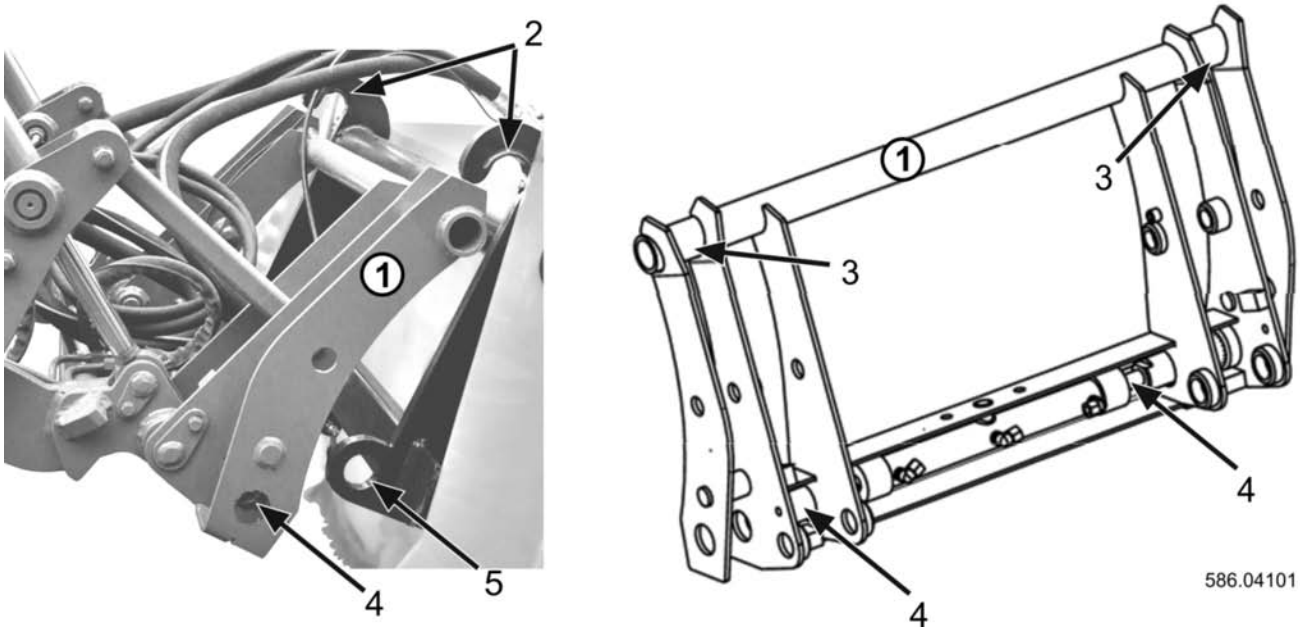
Setting the switch in the middle position enables the powertrain's neutral position.

5.7 Connecting tools

The machine fork is generally delivered with a “KUNTA 500” type quick tool attachment. Tool attachment of some other type is also available by order. The tool is electro-hydraulically locked from the cabin.

5.7.1 Connecting tools at front

Figure 45.



Connect a front tool as follows:

A. Lower the fork and turn the quick attachment frame (1) to the ladle emptying position.
B. Drive behind the tool and lift the fork so that the hooks on the tool (2) attach to the diagonal bar of the quick attachment device (3).
C. Lift the fork up and turn the quick attachment device to the ladle filling position, causing the attachment pins (4) to enter the attachment holes (5) of the tool.

Connect hydraulic hoses:

Varoitus! Varning! Warning!

Before setting off, ensure that the pins are properly in place.

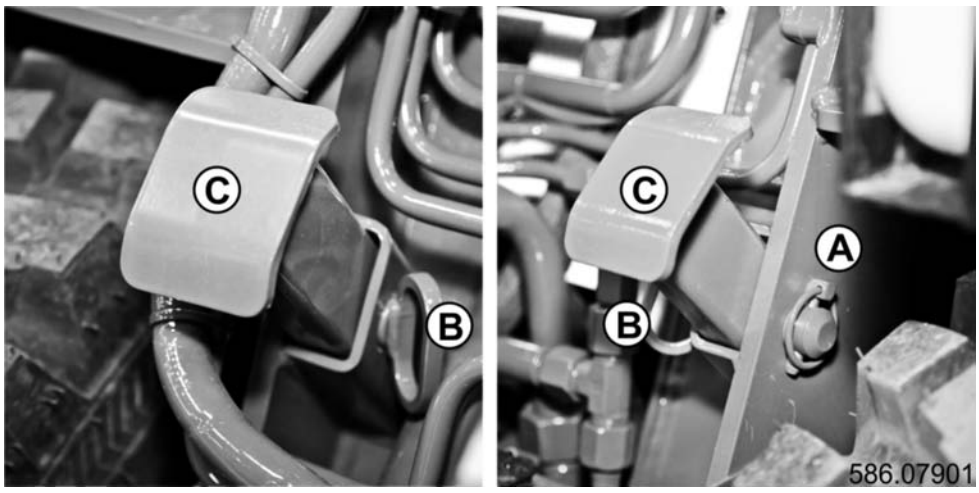
Release a front-attached tool as follows:

A. Lower the tool onto a level platform and press the tool lock switch, withdrawing the attachment pins towards the centre line of the machine.
B. Turn the quick attachment frame in the ladle emptying position and lower the fork, releasing the tool hooks.
C. Reverse the machine away from the tool.

5.7.2 Ploughing supports

The ploughing supports (2 pcs) are intended to support the front fork when ploughing, for example.

Figure 46.



- ► Remove the R grommets (A).
- ► Pull out the locking pins (B).
- ► Lower the fork to the most suitable working height for the tool.
- ► Lift the ploughing supports (C) at a suitable working height (same on both sides), and install the locking pins (B) and R grommets (A).

Info!

The ploughing supports are adjustable to four different heights.

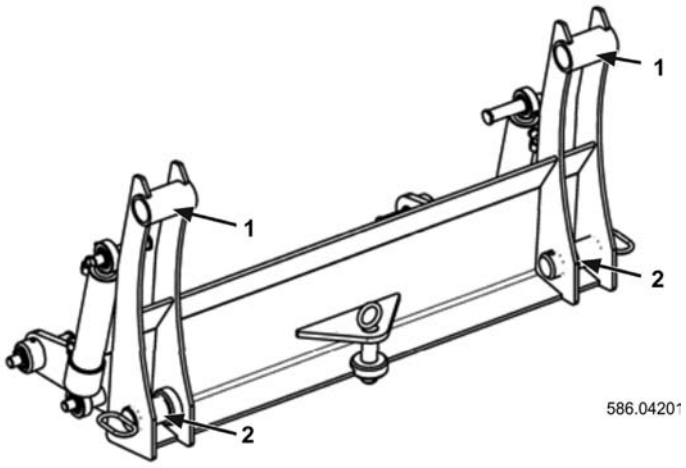
Varoitus! Varning! Warning!

Never access areas under the fork unless the fork is supported with the maintenance stand! See 6.1.3 Front fork maintenance stand page 43.

5.7.3 Connecting tools at back

An optional rear lifter is available for connecting tools. Tools are connected to the rear lifter manually, using separate pins.

Figure 47.



1. Tool hook attachment points.
2. Attachment pins.

Connect a rear tool as follows:

A. Remove the attachment pins (remove the ring pins and pull out the pins).
B. Lower the rear lifter fully and reverse the machine in front of the tool.
C. Lift up the lifter to attach the tool hooks to their correct locations (1).
D. Lift the rear lifter fully up and install the attachment pins.
E. Lock the pins in place with ring pins.

Remove a rear tool as follows:

A. Lower the tool onto level ground.
B. Remove the tool attachment pins and fully lower the rear lifter.
C. Drive the machine away from the tool and install the attachment pins on the lifter.
D. Lock the pins in place with ring pins.

5.7.4 Connecting/disconnecting hydraulic hoses

Figure 48.

- ► Lower the fork, and lower the tool in the quick attachment device onto level ground.
- ► Turn off the engine.
- ► When connecting a hydraulic hose to a tool, remove the protective plug from the connector and ensure that the quick connectors (on both the machine and tool) are absolutely clean; if necessary, clean them before attaching.
- ► Pull back on the quick connector's locking ring, press the connector into place and let go of the lock ring to lock the connector into place.
- ► When removing the hydraulic hose of a tool, clean the top of the connector (if necessary), pull back on the locking ring, and remove the quick connector.
- ► Immediately reinstall clean protective plugs onto the connectors.
- ► Wipe off any excess hydraulic oil.

5.7.5 Trailer hitch

If the machine is equipped with a trailer hitch, a pulling tool or trailer may be attached to it. The trailer hitch has a ball with a diameter of 50 mm, or a trailer pin with a diameter of 30 mm.

Follow any traffic regulations concerning the trailer or equipment being towed.

Huomaa! Notera! Note!

Remember to lock the knob with a ring pin before setting off.

5.8 Light / heavy duty

By using the switch on the dashboard you can select a driving programme suited for your work. The driving programme affects the characteristics of the powertrain and diesel engine.

Light duty

The machine quickly accelerates to maximum speed. This feature can be used during transfer, ploughing and other work that do not require a high oil output from the operating hydraulics while working.

Heavy duty

This feature is used when the working hydraulics require a high amount of oil in relation to the driving speed. Such tasks include sweeping, cutting grass and plants, and snow-moving.

The crawl pedal achieves the same effect.

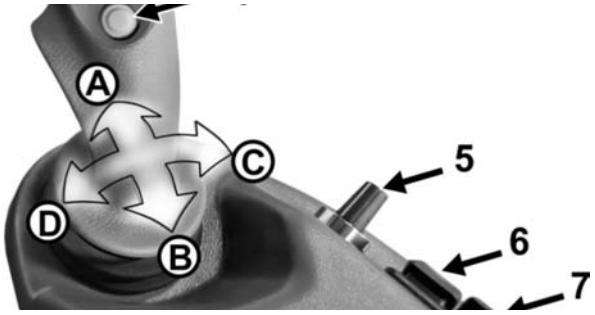
Info!

The maximum driving speed and pulling power are similar for both programmes.

5.9 Tools with hydraulic motor operation

Tools with hydraulic motor operation can be attached to the front and rear of the machine and on the bonnet. The hydraulic output of the tool installed at the rear cannot be adjusted. The hydraulic output of the tool installed at the front can be adjusted using the potentiometer (5) in the front elbow rest of the seat.

Figure 49.



The potentiometer values result in the following approximate output.

5.9.1 Adjustable hydraulic output for front output

Potentiometer output	Output (approximate)
1	10 l/min
2	20 l/min
3	30 l/min
4	40 l/min
5	50 l/min
6	67 l/min
7	70 l/min
8	80 l/min
9	90 l/min
10	100 l/min

Adjust output for the front tool according to the tool manual.

Huomaa! Notera! Note!

Always remember to check the highest allowed output from the tool manual or type plate.
Never exceed the highest allowed output, and always use the lowest possible value.

6.0 MAINTENANCE

6.1 General

Correct, timely maintenance is one of the key requirements for the machine's operational reliability. The operator of the machine plays an essential role when it comes to maintenance, since all maintenance operations listed in this manual must be completed at regular hourly intervals.

The intervals for periodic maintenance listed in the table apply to machines operating under normal conditions. Machines under heavy load must be serviced more frequently.

► In this manual, this paragraph symbol indicates a requested work performance.

The work stages have been registered in their completion sequence.

Varoitus! Varning! Warning!

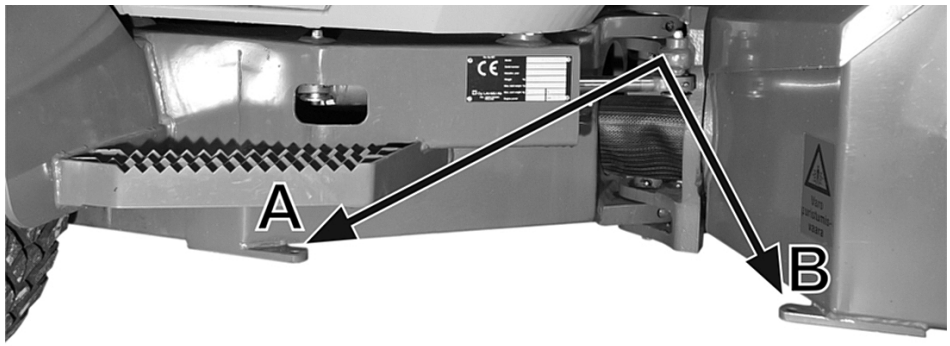
To avoid personnel injury, carry out the following procedures before starting maintenance:

► Drive the machine onto durable, level terrain.
► Apply the parking brake.
► Lower all tools onto the ground and stop the engine.
► Disconnect the main breaker and remove the key from the ignition.
► Attach a tag to the steering wheel that forbids starting the machine.

If the maintenance work requires having the engine running and/or lifting the machine using a lifting jack or some other device, proceed as follows:

Lock the body link using a locking bar as follows:

Figure 50.



486.01701

1. Straighten the machine body and attach the locking bar to the front (A) and rear (B) attachment points.
2. Lock the bar in place with the locking screws.

Huomaa! Notera! Note!

Once maintenance is complete, remember to remove the locking bar from the body link!

6.1.1 Lifting the machine with a lifting jack or lifting slings, for example

Varoitus! Varning! Warning!

Lock the body link using a locking bar

Info!

Only use suitable lifting tools with sufficient strength.

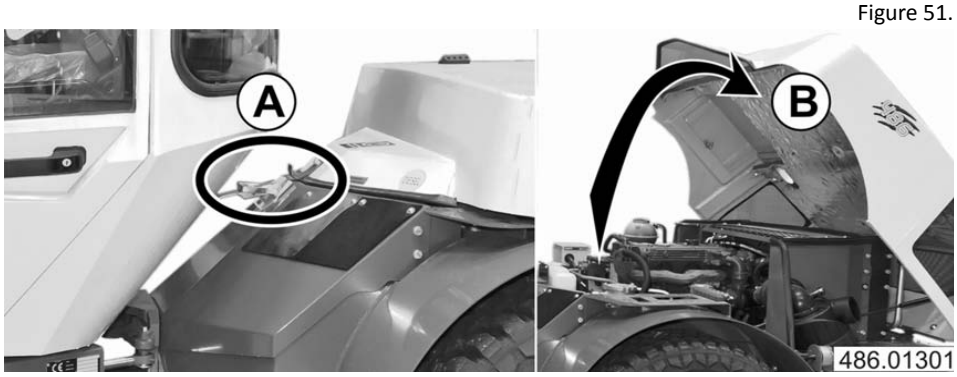
When the machine has been lifted up, support it or its parts using approved stands with sufficient strength.

Never go under the machine before it has been secured in place in a safe manner that meets all applicable regulations.

6.1.2 Access

Some of the serviceable locations on the machine are placed behind hatches. Once maintenance work is complete, remember to close all hatches.

Figure 51.



Open the latch (A) and lift up the bonnet (B). If accessories have been installed on the bonnet, they may need to be removed for service work.

Figure 52.

- Service hatches 1 and 2

► Remove the two attachment screws at the bottom edge of the service hatch, pull the hatch outward from the lower edge and lower it, which releases the hatch.

- Service hatch 3

► Open the latch and turn the hatch upward. Under the hatch, you find the cooling system expansion tank and the oil dipstick.

- Service hatch 4

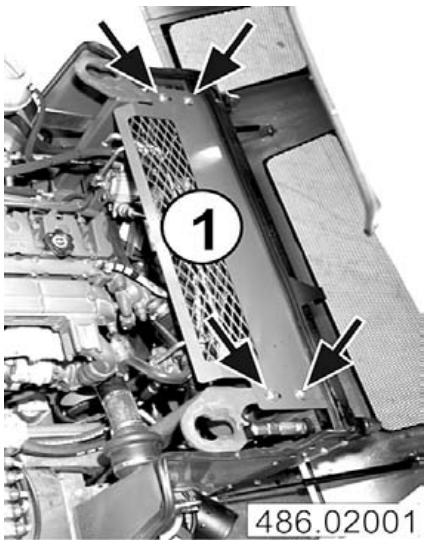
► Open the fastener and turn the service hatch open.

► Under the hatch, you find the cabin air filter.

In the engine compartment:

A. If necessary, remove the cover plate that is attached to the heater/ condenser cores with four fasteners

Figure 53.

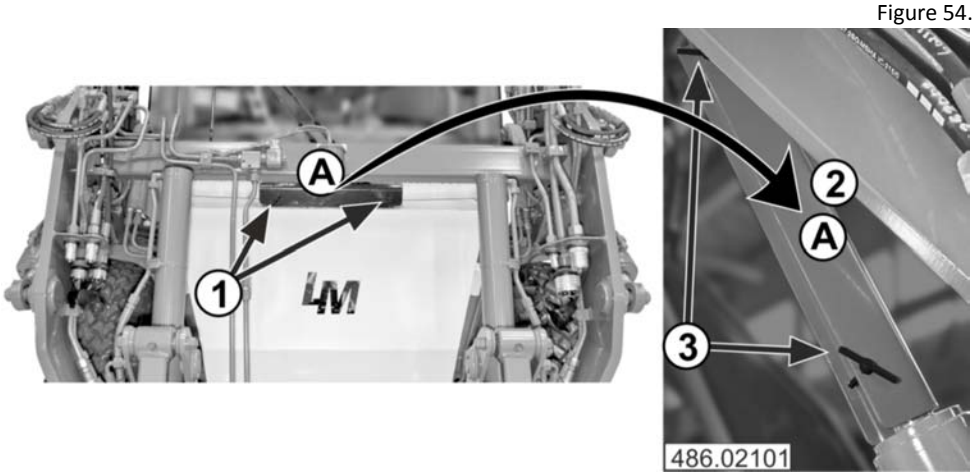


6.1.3 Front fork maintenance stand

Varoitus! Varning! Warning!

Always install the front fork maintenance stand before accessing the underside of the fork in its upright position.

Figure 54.



The fork maintenance stand (A) is attached to the front of the machine, between the forks.

1. Remove the maintenance stand by opening the 2 wingnuts and pulling out the locking screws.
2. When the fork is up, install the maintenance stand (A) on the piston shaft of the lifting cylinder.
3. Lock the stand in place with the locking screws.
4. Slowly lower the fork until it rests on the maintenance stand.

► Remove the maintenance stand in reverse order, and attach it to the correct storage location.

Figure 55.

6.1.4 Towing the machine

Varoitus! Varning! Warning!

TOWING THE MACHINE IS FORBIDDEN!

Info!

- If the machine must be transported, a transport platform must be used.
- The drive hydraulics will prevent the wheels from spinning while towing!

In case of emergency, the machine may be **towed for a short distance (max. 10 m)**.

In this case, the following instructions must be closely followed:

- Towing speed **may not exceed 2 km/h**.
- Towing distance may **not exceed 10 m**.
- Before towing, the pumps and hub motors must be checked for defects. These components have parts that may cause additional damage if they are moved while damaged.

6.1.5 Lowering the fork in case of failure

If the fork is up but the engine cannot be started or there is no power, contact an authorised service location.

Varoitus! Varning! Warning!

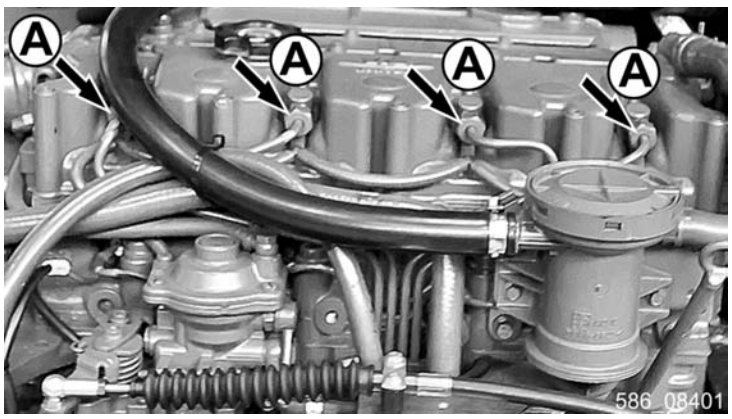
Never access areas under the fork unless the fork is supported with the maintenance stand.

6.1.6 Bleeding the engine

The fuel must be bled if the machine has run out of fuel or the fuel filter has been replaced.

Perform the bleeding as follows:

Figure 56.



1. Loosen at least two of the spray pipe connections (A).
2. Use the starter to turn the engine, until there are no air bubbles in the fuel leaking out of the spray pipes.
3. Carefully tighten all the loosened spray pipes.

6.1.7 Pressure accumulators

Figure 57.

The machine has two pressure accumulators for the floating of the fork. These accumulators retain pressure even when the engine is stopped. This must be taken into account while servicing or repairing the machine.

Varoitus! Varning! Warning!

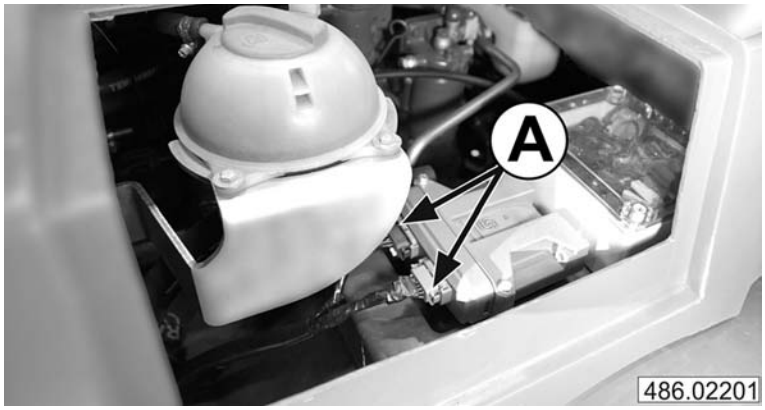
Never open the hydraulic connections without first making sure that all the pressure accumulators are at zero pressure. If you are unsure about what you are doing, do not touch the hydraulic system pipes and hoses.

6.1.8 Welding

If welding is required on the machine or a tool attached to it, proceed as follows:

1. Turn the main power switch to OFF.

Figure 58.



2. Open the rear frame's right service hatch from the bonnet and disconnect the engine control unit wire connectors (A).
3. Protect the hydraulic hoses and electrical wires against sparks, and take fire safety into account.
4. Attach the earthing electrode of the welding device as close to the welding point as possible.

6.1.9 Fire safety

The risk of fire can be reduced by keeping the machine clean under all circumstances.

► Remove all foreign material and dirt at the beginning of the workday. Pay special attention to cleaning the engine and exhaust systems.

The operator is responsible for the regular cleaning of the machine.

► Repair any leaks and immediately wipe off any spilled oil or fuel.

The fuel is inflammable and may cause a fire or an explosion.

Info!

Do not refuel or service the fuel system while welding, or in the vicinity of open flames, burning cigarettes etc. Sparks or flames may cause an explosion of the gases erupting from the batteries.

Varoitus! Varning! Warning!

To avoid accidents, proceed as follows:

- Always disconnect the negative battery cable first and re-connect it last.
- When using an auxiliary battery to start the machine, follow the instructions provided in this manual.
- Never short circuit the battery terminals with a metal object.
- Never weld, grind, or smoke near the batteries.
- Check electrical equipment for loose connections or damaged insulation.
- Repair or replace all loose or damaged parts.

6.2 Hazardous waste

Collect all hazardous waste generated during maintenance. Deliver waste oil, used filters and anti-freeze to a hazardous waste processing plant.

Oily rags must be disposed of in a safe manner following all applicable regulations.

Batteries contain corrosive acids and heavy metals; ensure that they are disposed of following all valid regulations.

Huomaa! Notera! Note!

Never dispose of hazardous waste by allowing it to discharge into the soil or the sewage system!

Info!

Always ensure that hazardous waste is disposed of according to regulations. Take good care of the environment and avoid polluting it with foreign matter.

6.3 Periodic maintenance table

Locations for periodic maintenance

Table: 6

Location / maintenance task:	Maintenance interval (hours)						Y
	10	50	250	500	1000	2,000	2 yrs
1. Engine oil level check, See 6.5.1 on page 50.	X						
2. Engine coolant level check, See 6.5.2 on page 51.	X						
3. Tyre inflation pressure check, See 6.5.3 on page 51.	X						
4. Check for possible fluid leaks, See 6.5.4 on page 51.	X						
5. Washer fluid level check, See 6.5.5 on page 52.	X						
6. Hydraulic oil level check, See 6.5.6 on page 52.	X						
7. Air filter underpressure check (filter condition) 6.5.7 p. 52							
8. Lubrication of joints on lifter and stabiliser cylinders, See 6.5.8 on page 53.	X						
9. Lubrication of front fork and rear lifter joints, See 6.5.8 on page 53.	X						
10. Lubrication of ball joints on ladle cylinders and idlers, See 6.5.8 on page 53.	X						
11. Lubrication of tie rod joints, See 6.5.8 on page 53.	X						
12. Lubrication of ball joints on steering cylinder, See 6.5.8 on page 53.	X						
13. Lubrication of body link, See 6.5.8 on page 53.	X						
14. Cabin air filter cleaning, See 6.6.1 on page 54.		X					
15. Draining of fuel filter water trap, See 6.6.2 on page 54.		X					
16. Engine air filter cleaning, See 6.6.3 on page 55.		X					
17. Radiator/condenser core cleaning, See 6.6.4 on page 56.		X					
18. Alternator belt tension check, See 6.6.5 on page 56.		X					
19. Wheel fastener tightening torque check, See 6.6.6 on page 57.		X					
20. Brake pedal play check, See 6.7.1 on page 58.			X				
21. Engine oil change and filter replacement, See 6.7.2 on page 58.		(O)	X				
22. Engine air filter replacement, See 6.7.3 on page 60.			X				
23. Fuel filter replacement, See 6.7.4 on page 61.			X				
24. Check for leaks, tightening of joints and connectors, See 6.7.5 on page 61.			X				
25. Hydraulic oil return filter replacement, See 6.8.1 on page 62.		(O)		X			
26. Steering hydraulics filter replacement, See 6.9.6 on page 63.		(O)		X			
27. Fuel tank cleaning, See 6.9.1 on page 63.					X		
28. Brake function check, See 6.9.2 on page 63.					X		
29. Engine air filter and safety element replacement, 6.9.3 p. 63					X		
30. Pressure measurement and adjustment of steering hydraulics, See 6.9.4 on page 63.					X		
31. Pressure measurement and adjustment of operating hydraulics, See 6.9.5 on page 63.					X		
32. Hydraulic oil tank cleaning and oil replacement, See 6.9.6 on page 63.					X		
33. Cabin fresh air filter replacement, See 6.9.7 on page 64.					X		
34. Battery check, See 6.9.8 on page 64.							
35. Alternator wiring check, See 6.10.1 on page 65.						X	
36. Starter motor wiring check, See 6.10.2 on page 65.						X	
37. Nozzle inspection and cleaning, See 6.10.3 on page 65.						X	
38. Cooling system cleaning and fluid replacement, See 6.11.1 on page 65.							X
39. Hydraulic oil tank breather replacement							X

Note!

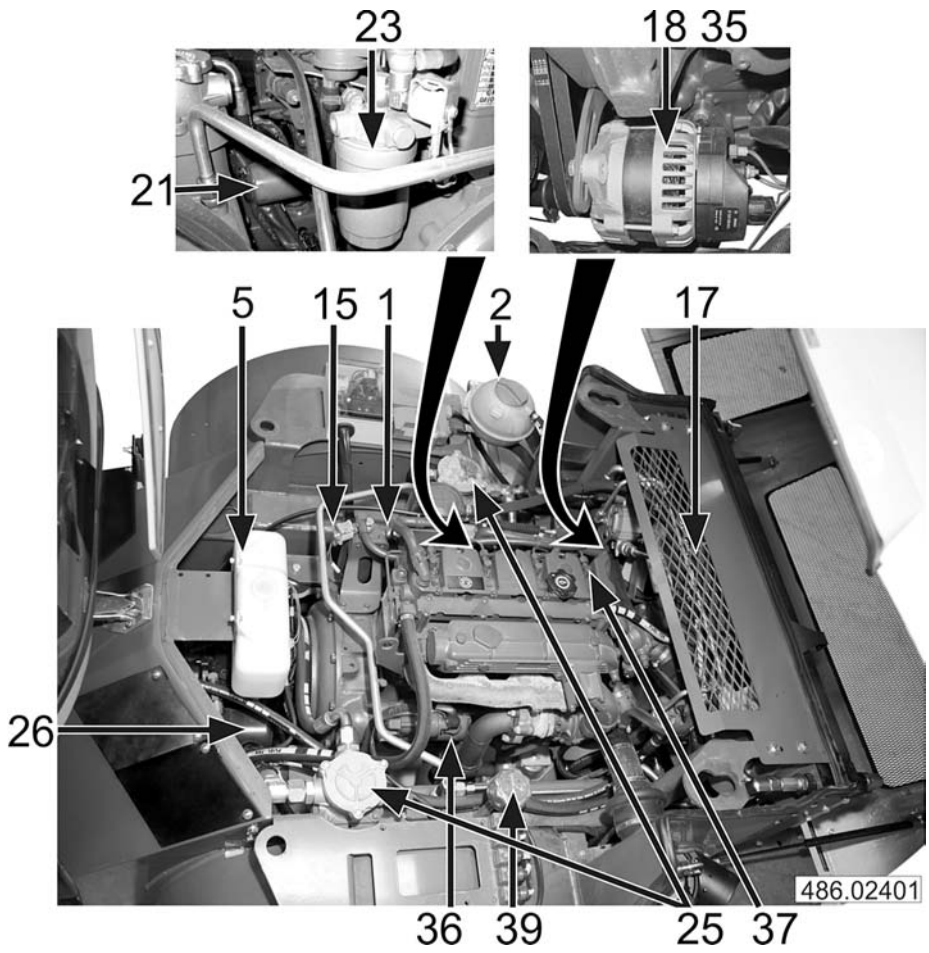
- The 10-hour service must be completed each day before starting the engine.
- The 50-hour service must be completed at least once a week.
- The 500-hour service must be completed at least once every 6 months.
- The 1,000-hour service must be completed at least once a year.
- 2 yrs refers to service that must be completed every two years, regardless of operating hours.
- (O) means that the service is first carried out after 50 hours of operation, and afterwards at the intervals marked with X.

The above intervals are based on normal operating conditions. When working under sub-optimal conditions, reduce the intervals accordingly.

6.3.1 Service locations in the engine compartment.

The reference numbers in the figure also refer to the locations in the maintenance table.

Figure 59.

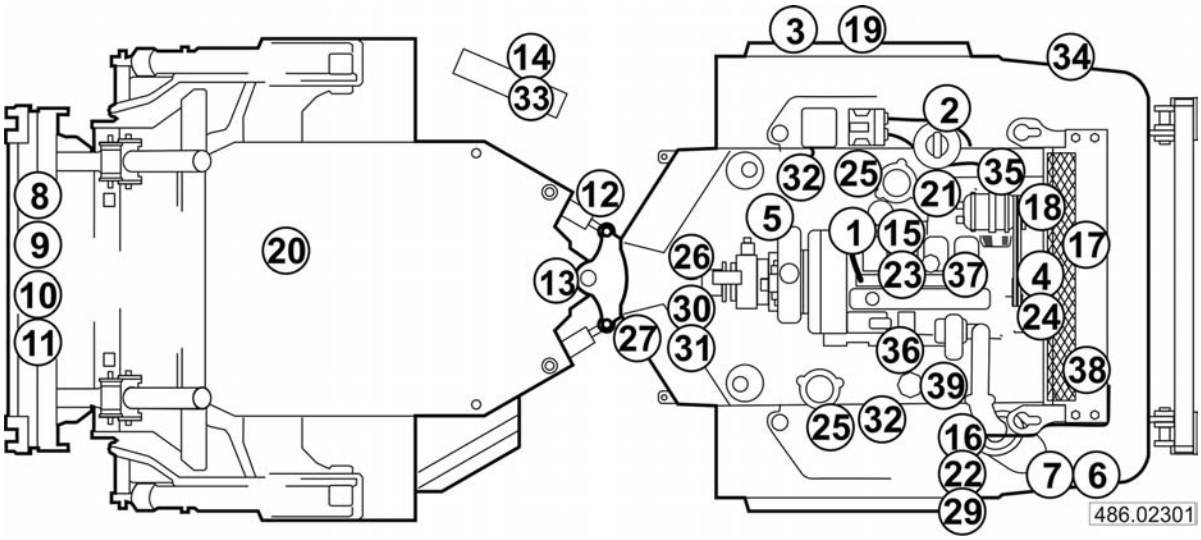


1. Oil dipstick
2. Cooling system expansion tank.
5. Windscreen washing liquid tank.
15. Fuel filter water trap.
17. Radiator/condenser cores.
18. Alternator/belt tensioning.
21. Engine oil filter.
23. Fuel filter.
25. Hydraulics return filters.
26. Drive hydraulics filter.
35. Alternator/wiring check.
36. Starter/wiring check.
37. Nozzle check.
39. Hydraulic oil tank breather.

6.3.2 All maintenance items

The reference numbers in the figure also refer to the locations in the maintenance table.

Figure 60.



1. Engine oil level check,
2. Engine coolant level check,
3. Tyre inflation pressure check,
4. Check for possible fluid leaks,
5. Washer fluid level check,
6. Hydraulic oil level check,
7. Inspection of air filter clogging sensor (= engine air filter clogging)
8. Lubrication of joints on lifter and stabiliser cylinders,
9. Lubrication of front fork and rear lifter joints,
10. Lubrication of ball joints on ladle cylinders and idlers,
11. Lubrication of tie rod joints,
12. Lubrication of ball joints on steering cylinder,
13. Lubrication of body link,
14. Cabin air filter cleaning,
15. Draining of fuel filter water trap,
16. Engine air filter cleaning,
17. Radiator/condenser core cleaning,
18. Alternator belt tension check,
19. Wheel fastener tightening torque check,
20. Brake pedal play check,
21. Engine oil change and filter replacement,
22. Engine air filter replacement,
23. Fuel filter replacement,
24. Check for leaks; tightening of joints and connectors,
25. Hydraulic oil return filter replacement,
26. Steering hydraulics filter replacement
27. Fuel tank cleaning,
28. Brake function check,
29. Engine air filter and safety element replacement,
30. Pressure measurement and adjustment of steering hydraulics,
31. Pressure measurement and adjustment of operating hydraulics,
32. Hydraulic oil tank cleaning and oil replacement,
33. Cabin fresh air filter replacement,
34. Battery check,
35. Alternator wiring check,
36. Starter motor wiring check,
37. Nozzle inspection and cleaning,
38. Cooling system cleaning and fluid replacement,
39. Hydraulic oil tank breather replacement

6.4 Recommended lubricants and volumes

Table: 40

Lubrication point	Volume	Quality recommendation	OE	Notes
Fuel tank	58 l	DIN EN590 Diesel oil *	DIN EN 590 Diesel oil	Use either summer orwinter grade according to temperature
Cooling system	12 l	Water/glycol 50/ 50%	Water/glycol 50/50%	Never use only water
Motor oil	6,4 l	15W/40 API CG-4, CF-4, CF, SH ASEA 98 E2, B4, B3, A2	Castrol CDR 10W/30	Use 5W/30 at temperatures below -15°C
Hydraulic oil	100 l	ISO-VG46 DIN 51524 part 1 DIN 51502	Castrol AWH 46	
Washer fluid	3,8 l	Water/washer fluid 50/50%	Water/washer fluid 50/50%	Never use only water
Lubrication points		Molybdenum sulphide grease	Castrol MS1 Grease	

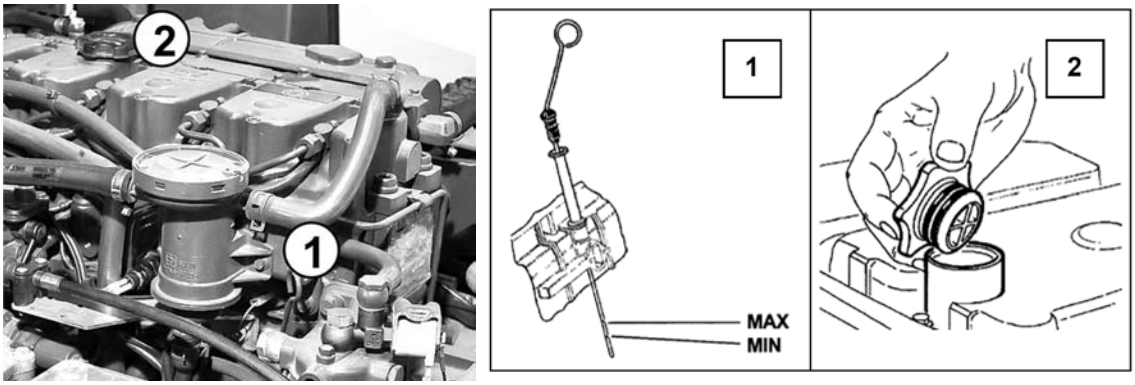
* See “Fuel Grades” in this manual.

6.5 10-hour service

Perform the following maintenance procedures daily, before starting the engine.

6.5.1 Engine oil level check (1)

Figure 61.



1. Dipstick 2. Oil filler neck.

When checking the oil level, the machine must be on a level surface. The oil level must be between the marks on the dipstick.

1. Turn off the engine a few minutes before the check.
2. Pull out the dipstick (1), wipe it clean, and reinsert it for a moment.
3. Pull the dipstick out again and check that the oil level is between the “Max” and “Min” marks.

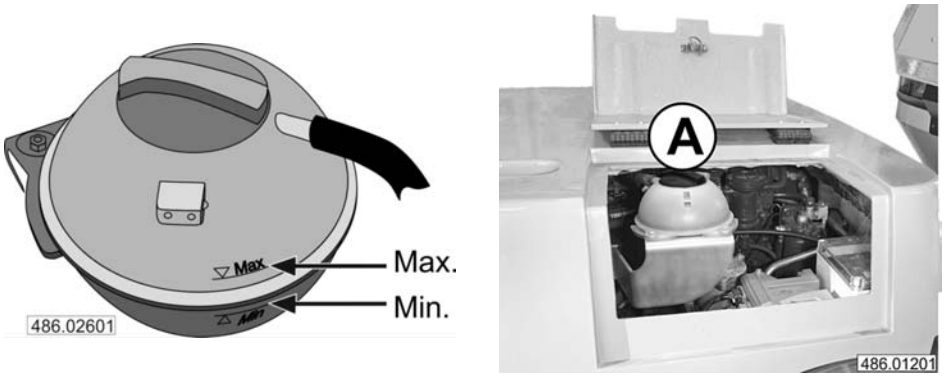
If necessary, add the recommended oil and recheck the oil level.

Info!

The grade of the oil added must match the oil in the engine.

6.5.2 Coolant level check (2)

Figure 62.

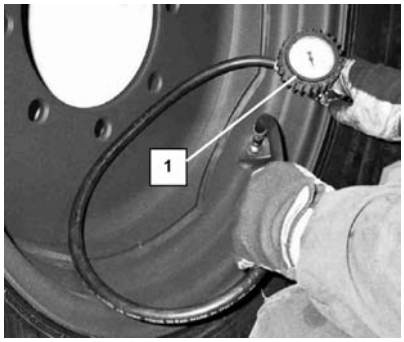


The level of the coolant must be between the “Min” and “Max” lines on the expansion tank (A) when cold. Add clean water as necessary. Remember to periodically check the freezing point of the coolant.

6.5.3 Tyre inflation pressure check (3)

A tyre pressure of 2.5–3.0 bar is used under normal conditions.

Figure 63.



1. Air pressure gauge

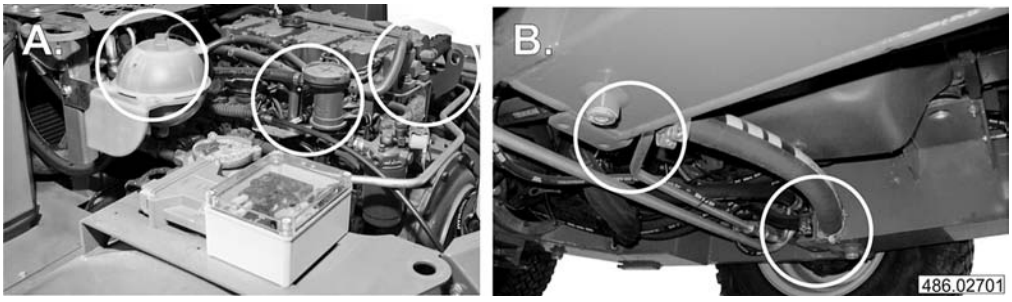
However, the tyre pressure may vary depending on the operation and operating conditions of the machine. The allowed tolerance is 1.7–5.7 bar.

6.5.4 Check for possible fluid leaks (4)

A daily visual check must be performed.

During periodic maintenance, check that all hoses and plugs are tight. If any leaks are detected, repair them before starting the machine.

Figure 64.



Check the following areas, for example:

A. Engine compartment.
B. Below the machine.

Check the following in the machine:

- Connections of fluid and hydraulic hoses, radiators/condensers, drain/ filler plugs etc.

6.5.5 Washer fluid level check (5)

The washer fluid tank is located below the bonnet, in the front of the engine compartment.

Figure 65.

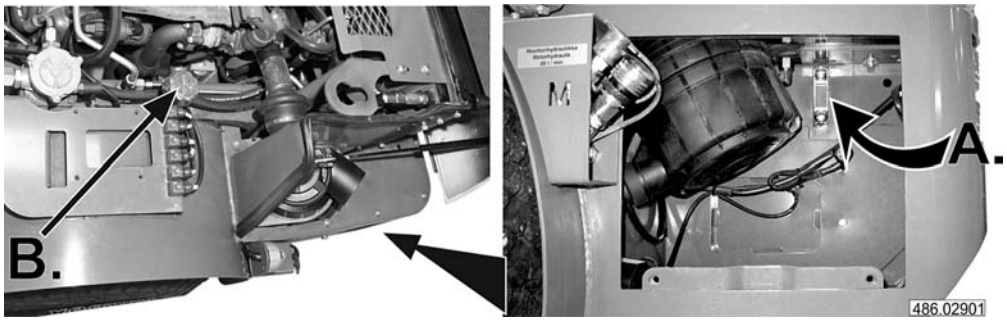
Always ensure that the tank has a sufficient level of fluid. Add washer fluid in the water. Ensure that the fluid does not freeze during the cold season.

6.5.6 Hydraulic oil level check (6)

The level of hydraulic oil can be checked using the sight glass on the left hydraulic oil tank in the engine compartment. The oil level must be visible on the sight glass.

When checking the oil level, the machine must be on level ground with the tools lowered, and the oil must be cool.

Figure 66.



A. Sight glass

B. Breather/filler cap

Oil can be added through the filler neck (B) on the tank, or through the leak oil connector at pressure.

When adding oil, ensure that the oil and the area around the filler neck are clean.

Info!

The grade of the added oil must match the oil in the tank.
The hydraulic oil tank is at an overpressure of 0.35 bar.

6.5.7 Air filter clogging sensor check (7)

Figure 67.

Run the engine at max RPM and check the colour of the glass tube in the clogging sensor (vacuum sensor) (A).

► If the colour of the sensor turns red when the engine speed increases, the air filter must be cleaned and replaced, if necessary.

6.5.8 Lubrication (8–13)

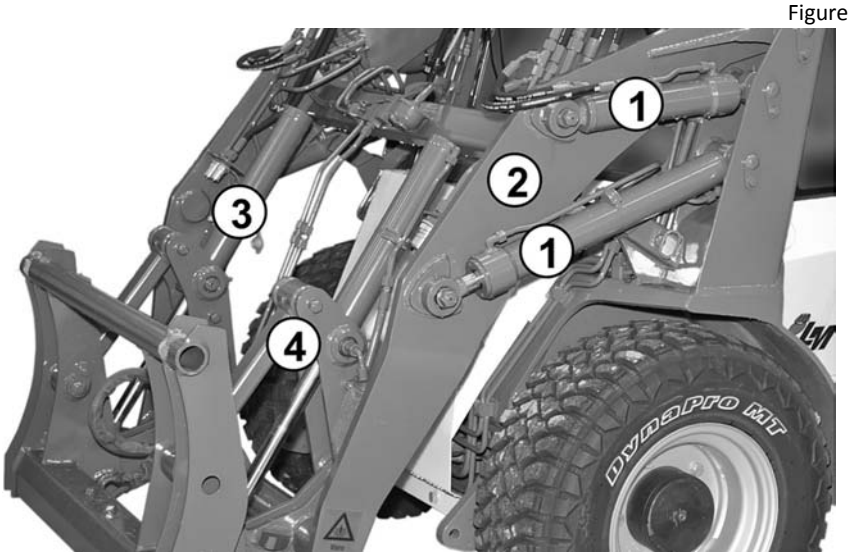
If the machine is equipped with central lubrication, only the universal joints of the articulated shafts are lubricated with a manual grease gun. If the machine does not have central lubrication, all the grease nipples are lubricated using a manual grease gun.

Lubrication using a manual grease gun:

- ► Clean the grease nipples and the tip of the grease gun.
- ► Press the tip of the grease gun perpendicular to the grease nipple, and apply a suitable amount of lubricant. The articulated shaft universal joints should be lubricated until the lubricant is visible underneath all the joint cup seals.

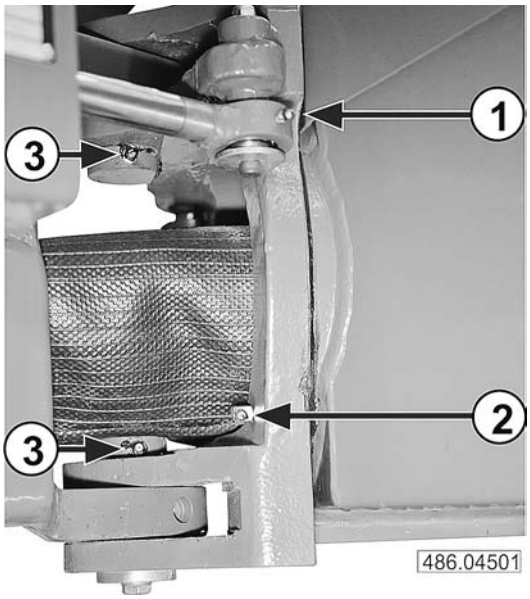
Lubricate the following points:

Figure 68.



1. 8) Ball joints for lifting and stabilisation cylinders (8 nipples).
2. 9) Joint pins for front fork (and rear lifter) (10 nipples).
3. 10) Ball joints for ladle cylinders (6 nipples).
4. 11) Joint pins on idler and tie rod (8 nipples).

Figure 69.



1. Ball joints for steering cylinders (2 pcs) (2+2 nipples)
2. Grease nipple for the rotating body link.
3. Grease nipples for the turning body links.

6.6 50-hour service

This service must be performed weekly, even if 50 hours of operation is not reached. The 50 h service also includes the tasks included in the 10-hour service.

6.6.1 Cabin air filter cleaning (14)

Figure 70.

- ► Open the fastener (2) and the air filter cover (1) on the right side of the cabin.
- ► Remove the air filter (3) and use compressed air to clean it.
- ► Clean from the inside out, and avoid rupturing the fibres on the filter.
- ► Check the condition of the filter and its seals. Replace the filter in case of damage.

6.6.2 Draining of fuel filter water trap (15)

Figure 71.

A. Drain tap

- ► Place a leak-tight container underneath the fuel filter and open the drain tap at the bottom of the filter.
- ► Close the tap when clean fuel (with no water) flows out.
- ► Bleed the fuel system if necessary (engine does not start or runs unevenly). See 6.1.6 on page 44.
- ► Start the engine and check for leaks.

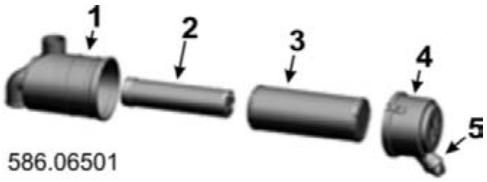
6.6.3 Engine air filter cleaning (16)

Figure 72.

The air filter is located behind the service hatch in the rear frame's rear left corner, and it points down. Remove the service hatch by opening the two fasteners from its lower edge, pulling it outward and lowering it.

Figure 73.

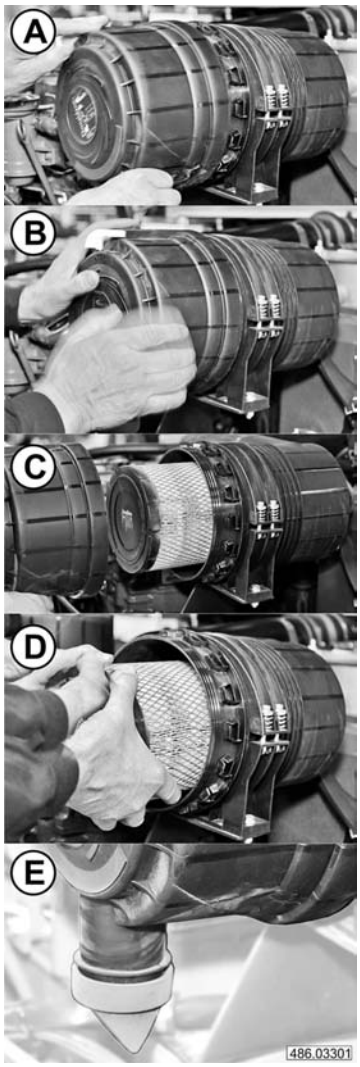
Filter parts:



1. Filter case. 2. Safety element. 3. Filter element. 4. Filter case cover. 5. Dust pocket.

To ensure a long operating life for a modern, turbo-charged engine, maintaining the good condition of the air filter is essential.

Figure 74.



Proceed as follows:

1. Stop the engine and remove the air filter's protective cover by removing the fasteners (A), rotating the cover, and pulling it out (B) and (C).
2. Pull out the filter element by rotating it (D).

► Inspect the filter element. If the element looks tidy and is in good condition, you can clean off the loose dust and dirt by lightly knocking on it. If the element is dirty or damaged, it must absolutely be replaced.

Huomaa! Notera! Note!

If the filter element is damaged, the safety element must also be replaced.

► Otherwise, check the condition of the safety element, but do not touch the safety element if it is in working order.

Info!

Filter manufacturers do not recommend cleaning the filter element with compressed air, since compressed air can easily tear the fibres of the filter paper and ruin a good filter element without leaving a visual indication of this.

► If you must use compressed air, use very low pressure and direct the air from the inside of the filter outwards. Limit air pressure to 2–3 bar, and do not press the air nozzle against the filter paper or too close to it.

► Inspect the condition of the filter element's rubber seals.

3. Clean the protective cover and the dust pocket (E) on the cover.

► Install the filter element and protective cover in the reverse order.

Info!

The safety element must be replaced no later than when the main element has been cleaned five times.

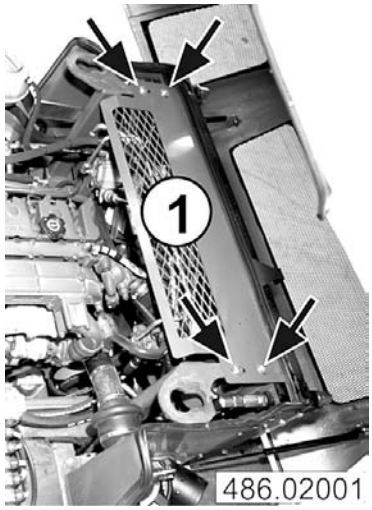
Huomaa! Notera! Note!

Never run the engine without the air filter element.

6.6.4 Radiator/condenser core cleaning (17)

The cores are located at the rear of the engine. If necessary, remove the protective cover (1) from the cores. The cover is attached using four fasteners.
Clean the cores by blowing them with compressed air from the engine side. Do not damage the lamellas of the core.

Figure 75.



Huomaa! Notera! Note!

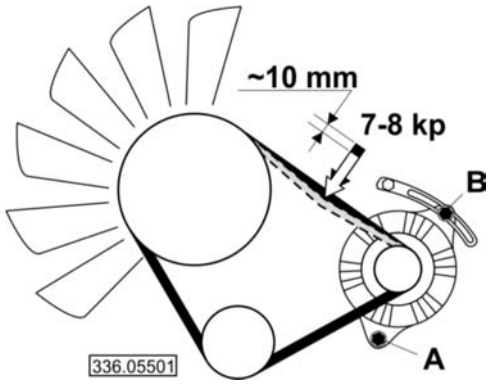
Never use a pressure washer! It may damage the lamellas of the core.

If necessary, clean the cores using a suitable solvent and water and/or compressed air.

6.6.5 Alternator belt tension check/adjustment (18)

► Inspect the alternator V-belts. If the belts are worn or oily, replace them.

Figure 76.



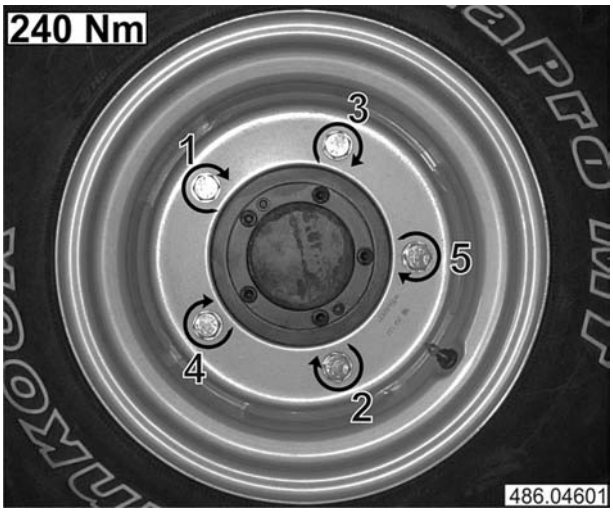
► Press one belt with your thumb, applying a force of 7–8 kp.
The belt must flex by approx. 10 mm.

Adjusting belt tension:

1. Loosen the fastener (B) (fastener below the alternator).
2. Loosen the adjustment locking screw (C).
3. Adjust belt tension by turning the alternator.
4. Tighten the adjustment locking screw (C), and check belt tension.
5. Tighten fastener (B) or redo items 2–4.

6.6.6 Wheel fastener tightening torque check (19)

Figure 77.



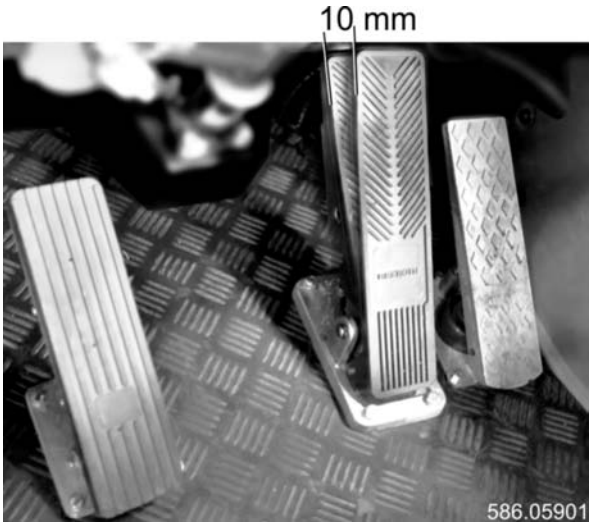
The tension of the wheel fasteners must be checked each day during the first 50 operating hours of the machine. The tightening torque is 240 Nm, and the tightening order is numbered in Figure 77.

6.7 250-hour service

Perform 10-hour and 50-hour service at the same time.

6.7.1 Brake pedal play check (20)

Figure 78.



The brake pedal must have approx. 10 mm of play. Adjust if necessary.

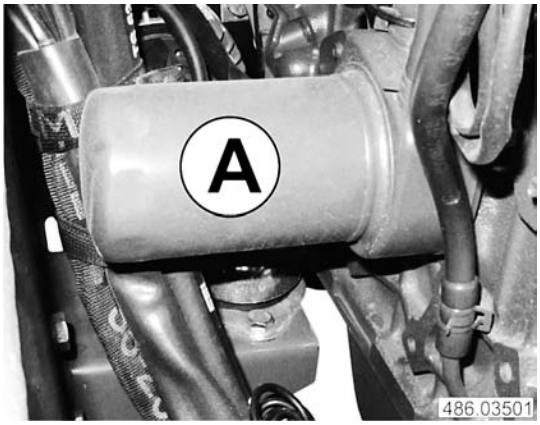
6.7.2 Engine oil change and filter replacement (21)

- Always replace the oil filter when changing the oil.
- Change the oil and filter after the first 50 operating hours.
- Carry out the next oil and filter changes every 250 hours.

Filter replacement

► Stop the engine and wait for approx 10 minutes to allow the oil to cool slightly.
► Place a pan under the filter (A).

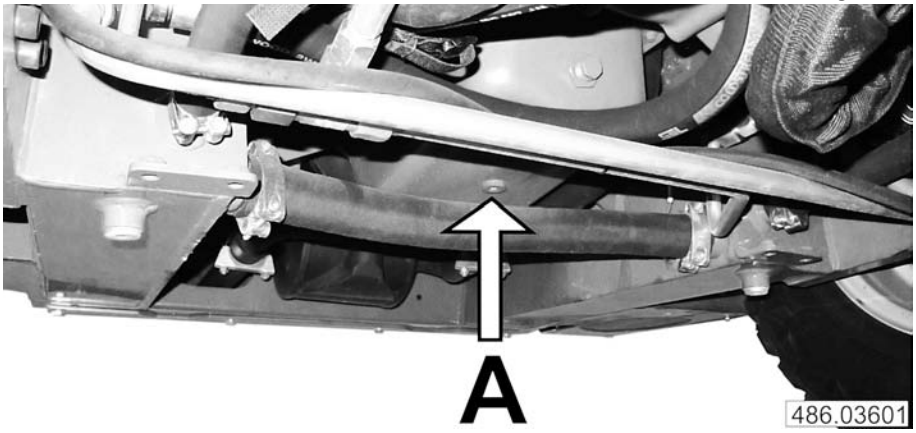
Figure 79.



► Remove the oil filter (A) using a filter wrench.
► Apply a thin coat of clean motor oil on the seal of the new filter, and install the filter.
► Tighten by hand, as over-tightening will damage the filter.

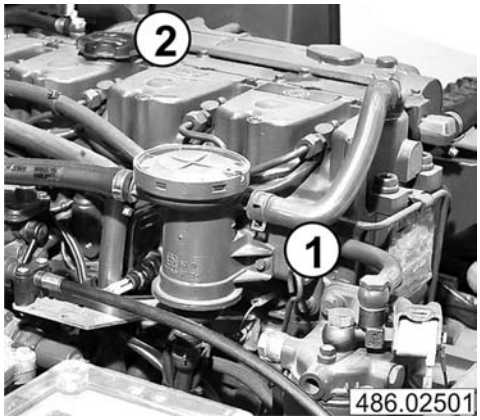
Oil change

Figure 80.



- ► Place a pan under the engine and remove the oil drain plug (A) from the oil pan.
- ► Once all the oil has been drained, install and tighten the drain plug.

Figure 81.



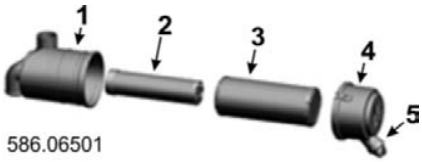
- ► Pour recommended motor oil into the engine through the oil filler neck (2) on the valve cover. See the Technical Specifications for amount and grade.
- ► Check oil level on dipstick (1)
- ► Start the engine and let it run at idle for approx. 1 minute.
- ► Stop the engine and recheck the oil level on the dipstick (1).
- ► Add oil as necessary.

Info!

To save time, first start draining the motor oil, then replace the oil filter, and finally complete the oil change.

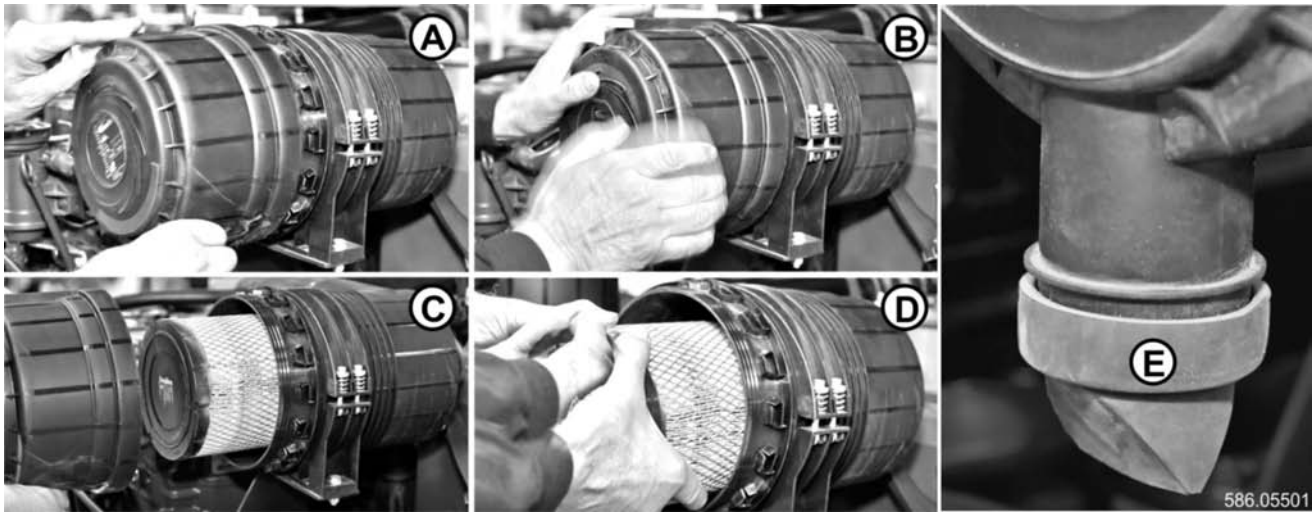
6.7.3 Engine air filter replacement (22)

Figure 82.



1. Filter case
2. Safety element
3. Filter element
4. Filter case cover
5. Dust pocket

Figure 83.



Proceed as follows:

1. Stop the engine and remove the air filter's protective cover by removing the fasteners (A), rotating the cover, and pulling it out (B) and (C).
2. Pull out the filter element by rotating it (D).

► Inspect the condition of the case and filter rubber seals. Replace if necessary.

3. Clean the protective cover and the dust pocket (E) on the cover.

► Inspect the safety element. Replace the element, if it is dusty or damaged. If the safety element looks tidy and in order, do not remove it.

4. Install the filter element and protective cover in the reverse order.

Info!

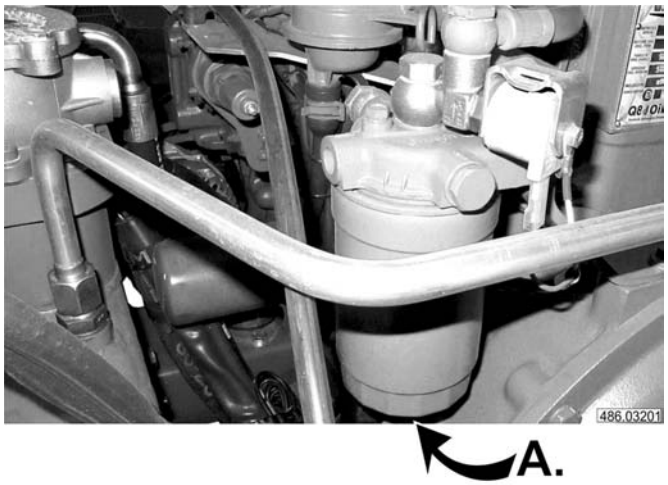
The safety element must be replaced latest when the filter element has been cleaned five times.

Huomaa! Notera! Note!

Never run the engine without the air filter elements.

6.7.4 Fuel filter replacement (23)

Figure 84.

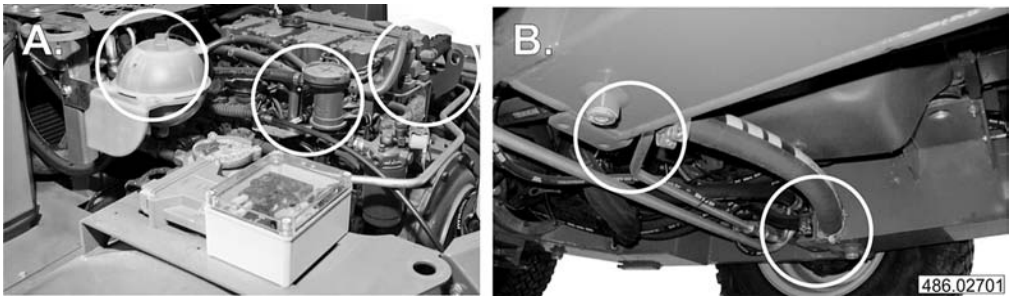


A. Fuel filter

- ► Park the machine on hard level terrain, and stop the engine.
- ► Place a pan under the fuel filter, and remove the filter using a filter wrench.
- ► Apply a thin coat of clean diesel fuel on the seal of the new filter, and install the filter. Tighten by hand, as over-tightening will damage the filter.
- ► Finally, bleed the fuel system.

6.7.5 Leak check (24)

Figure 85.



- ► Check the machine and all its pipes, hoses and connectors for leaks.
- ► Tighten loose hose ties and replace all damaged parts.

Contact authorised service if you discover leaks in the hydraulic pumps or motors. Leaks in the axles or the engine also necessitate contacting authorised service.

6.8 500-hour service

Perform 10-hour, 50-hour and 250-hour service at the same time.

6.8.1 Hydraulic oil return filter replacement (25)

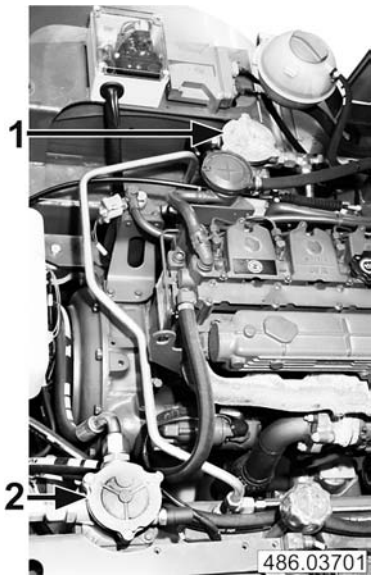
Figure 86.

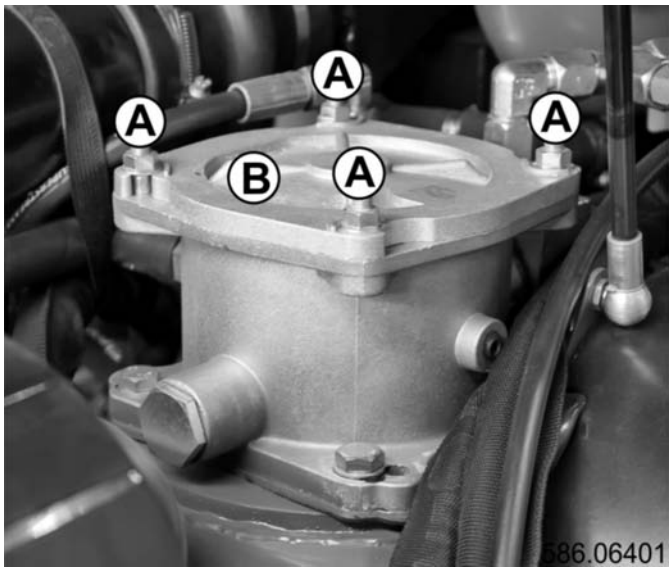
The hydraulic oil return filters remove dirt from the oil returning to the hydraulic tank.

► Park the machine on hard level terrain. Lower all tools, apply the parking brake and prevent machine movement.

• The machine has two hydraulic oil return filters (1 and 2). Replace them both.

Figure 87.

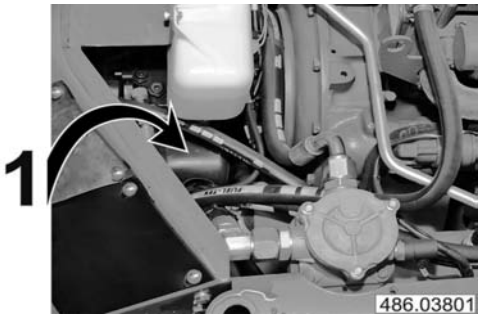




1. Loosen fasteners (A).
2. Turn the cover (B) clockwise and lift it up with the filter element.
3. Remove the old filter element.
4. Clean parts and seal surfaces.
5. Install a new filter element and O ring seal.
6. Install the filter element and cover.
7. Start engine and check for leaks.

6.8.2 Drive hydraulics filter replacement (26)

Figure 88.



1. Filter cup

► Park the machine on hard level terrain, and place a pan under the filter.
► Remove the filter cup and the filter element.
► Wash the cup in diesel fuel, install a new element inside the cup, and install the filter cup.

Info!

Hydraulic oil is normally replaced together with filter replacement, See 6.9.6 on page 63.

6.9 1000-hour service

Perform 500-hour, 250-hour, 50-hour, and 10-hour service at the same time.

6.9.1 Fuel tank cleaning (27)

Condensed water from the fuel tank is removed through the plug at the bottom of the tank.

► Place a pan underneath the tank and remove the plug. Close the plug once clean fuel flows out.

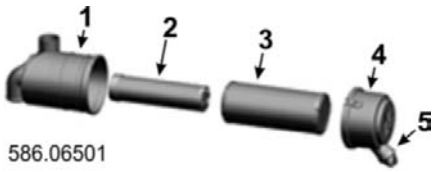
This work is best performed when the tank has a low amount of fuel in it.

6.9.2 Brake function check (28)

Check the function of the operating brake and parking brake. The machine must stay firmly in place at a 20% inclination with the parking brake applied.

6.9.3 Engine air filter and safety element replacement (29)

Figure 89.



1. Case 2. Safety element 3. Filter element 4. Cover 5. Dust pocket

► Stop the engine and remove the air filter cover (4).
► Remove the filter element and safety element (3 and 2), and clean the inside of the filter case (1) with a dry, lint-free cloth.
► Clean the dust pocket (4) and the filter case cover (5).
► Install the new safety element (2) and the new filter element (3).
► Close the air filter protective cover.

Huomaa! Notera! Note!

Never run the engine without the air filter elements.

6.9.4 Pressure measurement and adjustment of steering hydraulics (30)

The pressure measurement and adjustment of drive hydraulics must be performed by an authorised service workshop.

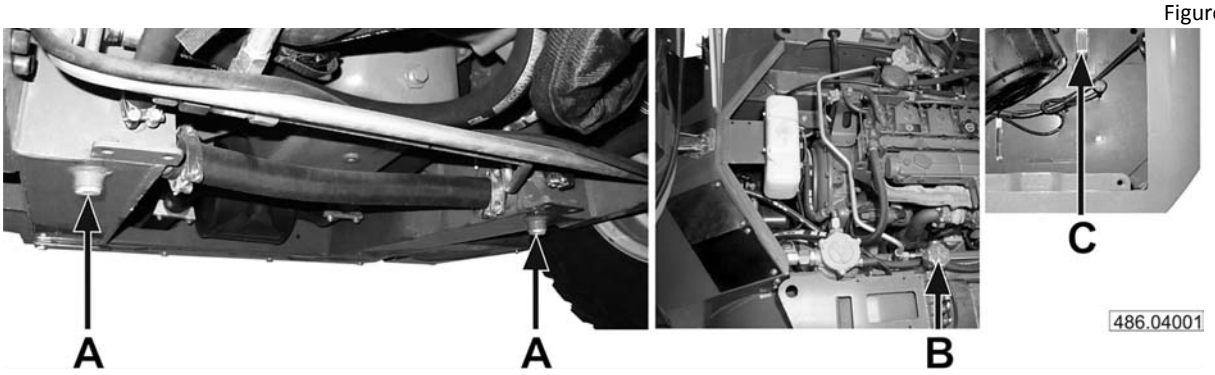
6.9.5 Pressure measurement and adjustment of operating hydraulics (31)

The pressure measurement and adjustment of work hydraulics must be performed by an authorised service workshop.

6.9.6 Hydraulic oil tank cleaning and oil replacement (32)

The cleanliness of the system and the oil are essential for the functionality of the hydraulic system. Ensure absolute cleanliness when working with hydraulics.

Figure 90.

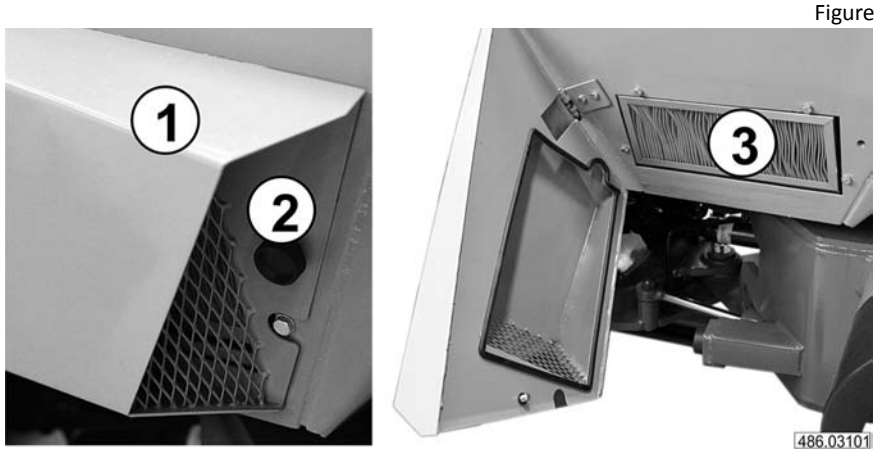


1. Place pans under the hydraulic oil tank drain plugs (A).
2. Remove the drain plugs and drain out all the oil.
3. Close the drain plugs and tighten them carefully.

4. Open the hydraulic oil tank breather cap (B) on the left side of the engine compartment, and pour the correct grade of oil through the filler neck until the oil level is visible in the sight glass (C).
5. Close the breather cap (B).
6. Start the engine and let it run for a few minutes.
7. Stop the engine and check the oil level, add oil as necessary.
8. Start the engine and check that all plugs and connections are tight.
9. Turn and attach the underpan in place.

6.9.7 Cabin fresh air filter replacement (33)

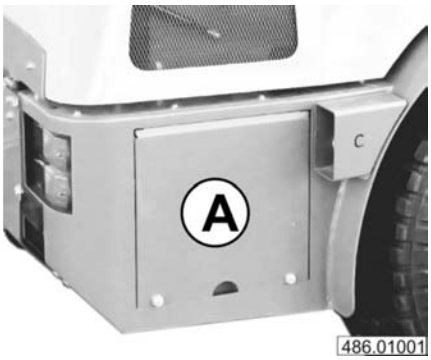
Figure 91.



- ► Open the hatch (1) below the right cabin side window.
- ► Remove the filter (3) and dispose of it according to regulations.
- ► Install a new filter and close the hatch.

6.9.8 Battery check (34)

Figure 92.



The battery (A) is located behind the rear right service hatch.

The battery is maintenance-free and requires no special service.

- ► Remove the fasteners on the bottom edge of the service hatch, pull the hatch outward from the lower edge and lower it.
- ► Check that the battery cables are properly attached, and that the cable connectors and the outside of the battery are clean.
- ► Check that the battery is firmly attached.
- ► Attach the service hatch.

Info!

The main power switch may be used to disconnect all electrical connections between the battery and the machine.

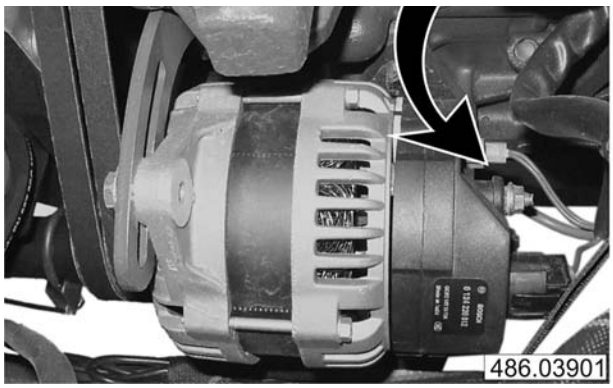
6.10 2,000-hour service

Perform 1,000-hour, 500-hour, 250-hour, 50-hour, and 10-hour service at the same time.

6.10.1 Alternator wiring check (35)

Inspect all the alternator wire connectors. Clean oxidised connectors and tighten loose connections. Replace damaged connectors.

Figure 93.



6.10.2 Starter motor wiring check (36)

Inspect all starter motor wire connectors. Clean oxidised connectors and tighten loose connections. Replace damaged connectors.

6.10.3 Nozzle inspection and cleaning (37)

The injectors' condition and opening pressure checks must be performed by authorised service.

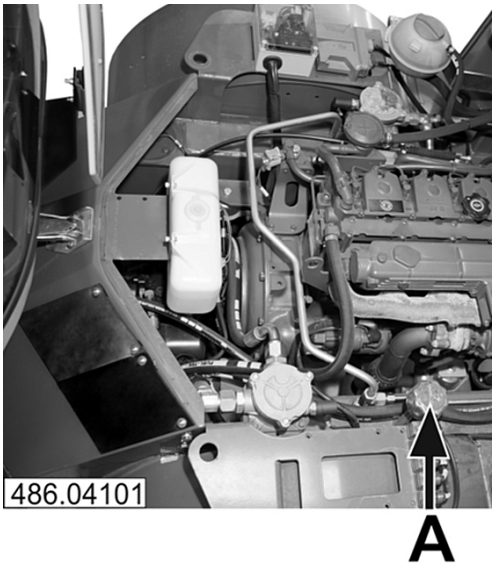
6.11 2-year service

6.11.1 Cooling system cleaning and fluid replacement (38)

1. Place a sufficiently large pan below the engine's lower hose.
2. Remove the expansion tank cap and disconnect the lower hose from the engine.
3. Let the coolant flow into the pan and install the lower hose.
4. Fit the lower hose in place and fill the cooling system with a mixture of clean water and radiator flush. Follow the mixing instructions on the radiator flush packaging.
5. Start the engine and let it run at idle for approx. 20 minutes.
6. Stop the engine and remove the radiator flush solution through the lower hose.
7. Fit the lower hose using a new hose clamp, and fill the cooling system with an anti-freeze mixture.
8. Start the engine and let it run for approx. 5 minutes.
9. Check the coolant level and add anti-freeze as necessary.
10. Ensure that there are no leaks.

6.11.2 Hydraulic oil tank breather replacement (39)

Figure 94.



► Replace the hydraulic oil filler neck breather cap (A).

6.12 Fuses and relays

The fuses and relays are located in the electrical switchboard below the document compartment. The fuses are of MICRO type.

Figure 95.

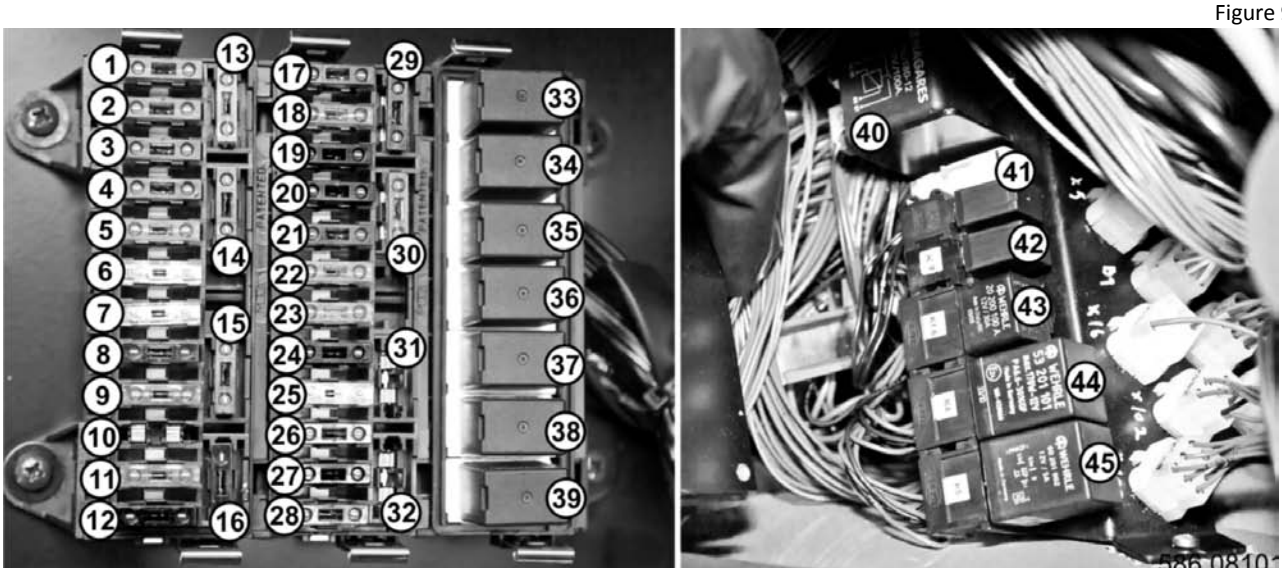


Table: 41

Number	Circuit	Size	Number	Circuit	Size
1	Left parking/instrument light	3 A	24	Mirror and seat heating	15 A
2	Right parking light	3 A	25	Fan/air conditioning	20 A
3	Left low beam	7,5 A	26	Ignition switch/glow excitation	10 A
4	Right low beam	7,5 A	27	Rear lifter/front switching valve/left cyl. hydr./rear tool electricity	15 A
5	High beams	10 A	28	Tachometer (30)	7,5 A
6	Front working lights	20 A	29	Fuel/temperature/tachometer (15)	7,5 A
7	Rear working lights	20 A	30	Radio memory	7,5 A
8	Turn signals	15 A	31	Not used	
9	Cabin temperature adjustment/Fan control	10 A	32	Not used	
10	Not used			RELAYS	
11	Roof beacon/power take-out	10 A	33	Rocker control relay	K15
12	Safematic/brake light/dome light/radio stand-by (15)	10 A	34	Central alarm activation relay	K13
13	Emergency flashers	10 A	35	Starter lock relay	K3
14	Engine compartment light	7.5 A	36	Front tool electricity (push-button)	K1.4
15	Indicators	3 A	37	Front tool electricity (rocker switch)	K1.3
16	Lock/drive programme selection	7.5 A	38	Pre-control	K1.2
17	Parking brake	15 A	39	Engine hydraulics lowering	K1.1
18	Drive powertrain	10 A	40	Main power relay	K2
19	Pre-control main power	15 A	41	Drive system relay	
20	Front socket/quick-release locks/fork floating and flexing	15 A	42	Pre-control power cut-off relay	K7
21	Engine stopper (15)	20 A	43	Reversing lights	K1.6
22	Windshield wiper/washer/horn	10 A	44	Mist-off relay	K5
23	Rear window wiper/washer	3 A	45	Rocker relay	K9

Only use the above fuse sizes! The engine compartment fuse and relay box has the following fuses: Main power 80A , Ignition 50A, Glow 50A (of MAXI type). See Engine compartment components 3.8.1 p. 18

6.13 Machine storage

6.13.1 Storing the multi-process machine for less than 2 months

No special actions are required, if:

- The machine has been regularly serviced.
- The machine is clean
- Coolant has a suitable freezing point for the ambient temperature.
- The fuel tank is full.
- Battery storage has been arranged.

6.13.2 Storing the multi-process machine for more than 2 months

The following procedures are required, if the machine is left in storage for over 2 months:

- ► Clean the machine inside and out, and perform general lubrication.
- ► Let the engine run until it reaches normal temperature, and drive the machine for a while.
- ► Change engine oil and replace filter.
- ► Open the fuel filter drain tap, and let out any water and deposits. Close the tap.
- ► Clean the fuel tank and fill it with clean diesel fuel that suits the ambient temperature. Run the engine for approx. 5 minutes.
- ► Clean the engine air filter case and element.
- ► Drain and rinse the cooling system, and fill it with the recommended anti-freeze mixture.
- ► Ensure that the batteries are fully charged. If the machine is stored in a cold environment, remove the batteries. Check the battery charge every 30 days.
- ► Store the machine in a dry, warm space, and protect it against sunlight. Lift the machine's wheels of the ground using proper stands to support it.
- ► To prevent rust, grease all exposed cylinder shafts.

6.14 Machine commissioning

6.14.1 After storage of less than 2 months

- ► Check that the batteries are fully charged.
- ► Check the oil and fluid amounts and tyre pressures.
- ► Perform general lubrication.
- ► Bleed the fuel system if necessary.
- ► Start the engine, but do not let it run above 1,000 r/min.
- ► Perform a test drive to ensure that all equipment works correctly.

6.14.2 After storage of more than 2 months

- ► Check tyre pressures.
- ► Remove the protective covers and lower the machine.
- ► Open the fuel filter drain tap, and let out any water and deposits. Close the tap.
- ► Check engine oil level.
- ► Check coolant level.
- ► Check that the batteries are fully charged.
- ► Connect battery cables and tighten properly.
- ► Check hydraulic oil level.
- ► Check condition and tension of V-belt.
- ► Start the engine, but do not let it run above 1,000 r/min.
- ► Ensure that all covers and hatches are in place and properly attached.

Varoitus! Varning! Warning!

Before starting the engine, ensure that all controls are in neutral and that the parking brake is on.
Never run the engine in a closed space. Sufficient ventilation must be ensured under all conditions.

7.0 TECHNICAL SPECIFICATIONS

7.1 Dimensions

Table 42:

DIMENSIONS	[mm]	WEIGHTS	[kg]
Length, rear lifter	4000 mm	Kerb weight	2660 kg
Width	1650	Front axle weight	1340 kg
Height	2100 mm	Rear axle weight	1380 kg
Wheelbase	1927 mm	Largest permitted weight for front axle	3500 kg
Track width	1330 mm		
Turn radius, min	1533 mm	Largest permitted weight for rear axle	3500 kg
Turn radius, max	8183 mm		
Ground clearance	210 mm		

7.1.1 Engine, general

Model:	VM Motori D754 SE3, diesel
Cylinder diameter:	94 mm
Stroke:	107 mm
Number of cylinders:	4 pcs
Displacement:	2970 cm^2
Nominal output:	51.5 kW (70 hp) 2600 r/min
Maximum torque:	220 Nm (1400 r/min)
Idle:	850 ± 50 r/min

7.1.2 Engine lubrication system

Gear-type pump and replaceable main flow filter.

Oil filter:	Paper
Minimum oil pressure:	1.2–1.6 bar

7.1.3 Fuel system

Fuel	Diesel*
Injection pump:	Row
Injection order:	1-3-4-2
Injection pressure:	250 bar
Fuel filter:	Paper

* Heating oil must not be used as fuel.

7.1.4 Cooling system

Thermostat-controlled, overpressurised.
Hydraulic motor powered fans.

7.1.5 Drive hydraulics

Closed, load-sensing system with driving direction switching using an electric selection switch.
Load automation monitoring engine operation.
Stepless speed ranges: 0–15 and 0–30 km/h.

Drive pump:	Variable displacement axial piston pump
Hub motors:	Radial piston motors on all wheels
Pump output:	135 l/min
Operating pressure:	350 bar

7.1.6 Work hydraulics

Load-sensing LS system.

Pump:	Variable displacement axial piston pump
Valves:	4-stem, electrically controlled
Pump output:	100 l/min
Maximum pressure:	200 bar

7.1.7 Steering hydraulics

Hydrostatic body steering. Steering system oil flow is taken from the operating hydraulic circuit using a priority valve.

Steering cylinders: 2 pcs

7.1.8 Other information concerning hydraulics

Hydraulic oil cooler in connection to engine radiator.

Oil volume: approx. 100 l

7.1.9 Brakes

Wet disc brakes on front wheel hubs. The parking brake affects the front wheels.

During normal operation, the hydrostatic powertrain is used for deceleration.

7.1.10 Axles

The hub motors mounted to the front and rear frame act as axles.

7.1.11 Tyres

Standard tyres: 31x11.5 R15

Inflation pressure:

- Minimum allowed pressure:1,5 bar
- Maximum allowed pressure:3,5 bar

Tyre pressures may vary depending on use. A general pressure guideline is 2.6 bar both front and back, unless otherwise stated on the tool.

7.1.12 Electrical system

Voltage:	12 V
Starter motor:	2,2 kW
AC alternator:	85 A
Battery:	12 V, 145 Ah
Earth:	Negative
Fuses:	See 6.12 / p. 67.
Headlight bulb:	H7/12V/55W
Working light bulb:	H3/12V/55W
Parking light bulb:	T4W/12V/4W
Turn indicator bulb:	P21W/12V/21W
Brake light bulb:	P21W/12V/21W
Warning light bulb:	H3/12V/55W
Engine compartment light bulb:	C5W/12V/5W
Cabin dome light bulb:	C10W/12V/10W

7.1.13 Air conditioning (Accessory)

Refrigerant charge (R 134): 1,35 kg

Other information:

8.0 Troubleshooting and repair

The following are a few instructions for troubleshooting. The list is only indicative and should not be considered a full troubleshooting diagram.

If the instructions below are not enough to rectify the problem, we recommend that you contact authorised service.

Always remember to check all fuses, oil levels and filters before contacting service or initiating repair.

8.1 Problem, cause, corrective action

Table 43:

Problem	Cause	Corrective action
Engine does not start or starting is difficult:	Out of fuel or wrong fuel grade?	Refuel, use suitable fuel for the temperature.
	Air or water in the fuel system?	Drain water from the tank. Check fuel pipe connections, repair as necessary. Bleed the fuel system.
	Oil viscosity too high?	Use suitable oil for the temperature.
	Flat battery?	Charge or replace the battery.
	Fuse 21 or 26 out?	Replace the fuse. See instructions!
Low engine power:	Low on fuel?	Refuel.
	Clogged air filter?	Clean or replace the filter.
	Clogged fuel filter?	Replace the filter.
The engine stops:	Out of fuel?	Refuel and bleed the fuel system.
Abnormal exhaust gas colour:	Low-quality fuel?	Use correct type of fuel.
	Excess oil in the engine?	Drain out the excess oil!
Too high a coolant temperature:	Too little coolant?	Refill to the correct level.
	Clogged radiator fins?	Clean the fins.
	Dirty anti-freeze?	Flush the cooling system, replace fluid.
	Overload?	Reduce engine load.
	Low-quality fuel?	Use correct type of fuel.
Machine not moving at the desired speed:	Too little hydraulic oil?	Add oil to reach the correct level.
	Drive hydraulics filter clogged?	Replace the filter.
Machine not moving at all:	Fuse number 18 out?	Replace fuse! See instructions!
Machine not moving forward or in reverse:	Broken driving direction switch?	Let authorised service replace the switch and inspect the circuit.
Driving programme not changing:	Fuse number 16 out?	Replace fuse! See instructions!
Forks not moving:	Fuse number 19 out?	Replace fuse! See instructions!
Floating not working:	Fuse number 20 out?	Replace fuse! See instructions!
The rear lifter is not working:	Fuse number 27 out?	Replace fuse! See instructions!
Front cylinder hydraulics not working:	Tool electricity button faulty.	Let authorised service replace the button and inspect the circuit.
Rear cylinder hydraulics not working:	Fuse number 27 out?	Replace fuse! See instructions!

9.0 Service memo

Always remember to write down completed service in the appropriate place in the service memo.

In the tables

The operating hours listed under periodic maintenance are the current readings for the machine's operating hour counter.

Also remember to complete the 10-hour and 50-hour service and the 2-year service on time.

Huomaa! Notera! Note!

Timely and correct maintenance is a prerequisite for keeping your warranty in effect.
The periodic maintenance item table; See 6.3 / p. 47.!
Make a copy of the table and write down the completed service, the technician, and the workshop. Give a copy to the customer or attach it to the machine's documentation.

Table 44:

10-hour service/daily inspections and lubrication
Perform the 10-hour service/inspection daily and together with all periodic maintenance! The inspections and lubrication points can be found in the maintenance table. PLEASE NOTE! Perform the daily inspections and lubrication regularly to ensure a long and effective operating life for your machine.

Table 45:

50 h service/every 50 h/min. once a week	Service done
Complete this service at 50-hour intervals, or at least once a week, together with the 10-hour service items. When the machine's hour counter shows 50 hours, complete the 10 and 50 hour service and the items marked with O in the 50-hour column. The work to be completed can be found in the maintenance table. PLEASE NOTE! This service is essential for the continued reliability of a new machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 46:

Hour counter reading: 250 hours	Service done
Complete this service when the machine's hour counter reads 250 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 47:

Hour counter reading: 750 hours	Service done
Complete this service when the machine's hour counter reads 750 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 48:

Hour counter reading: 1000 hours	Service done
Complete this service when the machine's hour counter reads 1000 hours! Complete the service items for 10, 50, 250, 500, and 1,000 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 49:

Hour counter reading: 1250 hours	Service done
Complete this service when the machine's hour counter reads 1250 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 50:

Hour counter reading: 1500 hours	Service done
Complete this service when the machine's hour counter reads 1500 hours! Complete the service items for 10, 50, 250, and 500 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 51:

Hour counter reading: 1750 hours	Service done
Complete this service when the machine's hour counter reads 1750 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 52:

Hour counter reading: 2000 hours	Service done
Complete this service when the machine's hour counter reads 2000 hours! Complete the service items for 10, 50, 250, 500, 1,000, and 2,000 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 53:

Hour counter reading: 2250 hours	Service done
Complete this service when the machine's hour counter reads 2250 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 54:

Hour counter reading: 2500 hours	Service done
Complete this service when the machine's hour counter reads 2500 hours! Complete the service items for 10, 50, 250, and 500 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 55:

Hour counter reading: 2750 hours	Service done
Complete this service when the machine's hour counter reads 2750 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 56:

Hour counter reading: 3000 hours	Service done
Complete this service when the machine's hour counter reads 3000 hours! Complete the service items for 10, 50, 250, 500, and 1,000 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 57:

Hour counter reading: 3250 hours	Service done
Complete this service when the machine's hour counter reads 3250 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 58:

Hour counter reading: 3500 hours	Service done
Complete this service when the machine's hour counter reads 2500 hours! Complete the service items for 10, 50, 250, and 500 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 59:

Hour counter reading: 3750 hours	Service done
Complete this service when the machine's hour counter reads 3750 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 60:

Hour counter reading: 4000 hours	Service done
Complete this service when the machine's hour counter reads 4000 hours! Complete the service items for 10, 50, 250, 500, and 1,000 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 61:

Hour counter reading: 4250 hours	Service done
Complete this service when the machine's hour counter reads 4250 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 62:

Hour counter reading: 4500 hours	Service done
Complete this service when the machine's hour counter reads 4500 hours! Complete the service items for 10, 50, 250, and 500 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 63:

Hour counter reading: 4750 hours	Service done
Complete this service when the machine's hour counter reads 4750 hours! Complete the service items for 10, 50, and 250 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Table 64:

Hour counter reading: 5000 hours	Service done
Complete this service when the machine's hour counter reads 5000 hours! Complete the service items for 10, 50, 250, 500, and 1,000 hours. The work to be completed can be found in the maintenance table. PLEASE NOTE! Timely periodic maintenance and daily inspections (10 hour maintenance) ensure an effective and long operating life for your machine!	Date: _____ Counter reading: _____ Technician: Stamp:

Huomaa! Notera! Note!

Remember to flush the cooling system and replace the coolant every two (2) years!

Huomaa! Notera! Note!

Even from this point on, ensure that your machine is periodically serviced according to this service programme. This ensures a good, productive operating life and high resale value for your machine.

Notes:

LM TOOLS
LM CABINS
LM TRAC